



Foreign Agricultural  
Service, United States  
Department of Agriculture



# Mozambique Food for Progress MERCADO Project

## Midterm Evaluation

October 2019

This publication was produced at the request of the United States Department of Agriculture. It was prepared independently by IMPAQ International, LLC.

# Midterm Evaluation of the MERCADO Project

The purpose of this midterm report is to measure progress made in achieving the intended outcomes from baseline by documenting the state at midterm of key dairy value chain actors who are MERCADO project beneficiaries; establishing project midterm values; providing recommendations; and, finally, generating data to be used for comparative analysis in the final evaluation of the project.

Agreement Number: FCC-656-2016/007-00

Project Duration: 2016-2021

Implemented by: Land O'Lakes Venture37

Evaluation Authored by: IMPAQ International, LLC

# USDA Food for Progress – Mozambique Expansion of Rural Cattle and Dairy Opportunities (MERCADO) Project, Mozambique

Midterm Performance Evaluation Report  
October 2019





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**PROJECT**

USDA Food for Progress, Mozambique Expansion of Rural Cattle and Dairy Opportunities (MERCADO) Project, Mozambique (2016-2021) – Midterm Performance Evaluation Report

**TASK & DELIVERABLE**

Midterm Performance Evaluation Report

## **ACKNOWLEDGEMENTS**

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The IMPAQ team would like to thank Land O'Lakes Venture37 (Venture37) and the U.S. Department of Agriculture (USDA) for their financial support. We also would like to thank the Venture37 staff in Washington DC and Mozambique for supporting and facilitating the rollout of the Mozambique Expansion of Rural Cattle and Dairy Opportunities (MERCADO) project's midterm evaluation. Special thanks go to Jose Caravela for his regional insights and his extensive technical support. The authors thank the Center for Development Management team for their professionalism and flexibility with data collection, including Bright Sibale, Abel Shaba, and Wingston Ng'ambi, and all the enumerators for their excellent work in the field.

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## LIST OF ACRONYMS AND ABBREVIATIONS

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|                  |                                                                              |
|------------------|------------------------------------------------------------------------------|
| <b>AI</b>        | Artificial Insemination                                                      |
| <b>CLW</b>       | Community Livestock Workers/Paravets                                         |
| <b>CMT</b>       | California Mastitis Test                                                     |
| <b>DHF</b>       | Dairy Herd Fund                                                              |
| <b>DIF</b>       | Dairy Innovation Fund                                                        |
| <b>DINAV</b>     | National Veterinary Directorate                                              |
| <b>FFPr</b>      | Food for Progress                                                            |
| <b>FGD</b>       | Focus Group Discussions                                                      |
| <b>GDP</b>       | Gross Domestic Product                                                       |
| <b>KII</b>       | Key Informant Interviews                                                     |
| <b>Venture37</b> | Land O'Lakes Venture37                                                       |
| <b>M&amp;E</b>   | Monitoring and Evaluation                                                    |
| <b>MDDP</b>      | Mozambique Dairy Development Program                                         |
| <b>MEL</b>       | Monitoring, Evaluation & Learning                                            |
| <b>MERCADO</b>   | Mozambique Expansion of Rural Cattle and Dairy Opportunities                 |
| <b>MSDDP</b>     | Manica Smallholder Dairy Development Program                                 |
| <b>NGO</b>       | Nongovernmental Organization                                                 |
| <b>OECD-DAC</b>  | Development Assistance Committee of the Economic Cooperation and Development |
| <b>SO</b>        | Strategic Objectives                                                         |
| <b>SOW</b>       | Scope of Work                                                                |
| <b>TOR</b>       | Terms of Reference                                                           |
| <b>USDA</b>      | U.S. Department of Agriculture                                               |

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## EXECUTIVE SUMMARY

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Land O'Lakes Venture37 (Venture37) has contracted with IMPAQ International, LLC (IMPAQ) to implement the evaluation of the five-year Mozambique Expansion of Rural Cattle and Dairy Opportunities (MERCADO) project, funded by the United States Department of Agriculture (USDA). The evaluation consists of three components: baseline and gender analysis (2016), midterm (2019, the focus of this report), and final (2021) evaluations. The purpose of this midterm report is to measure progress made in achieving the intended outcomes from baseline by documenting the state at midterm of key dairy value-chain actors who are MERCADO project beneficiaries; establishing project midterm values; providing recommendations; and, finally, generating data to be used for comparative analysis in the final evaluation of the project.

The MERCADO project is Venture37's third Mozambican dairy sector development initiative. The five-year project began in October 2016 and seeks to address critical weaknesses that currently impede or threaten the competitiveness and sustainability of the dairy market system. MERCADO uses a private-sector-driven market systems approach to attempt to establish a commercial-oriented, sustainable and competitive dairy market system in Mozambique that can be competitive locally, regionally, and nationally. To accomplish this goal, the project works to increase dairy productivity and quality at the farm level to help meet unmet demand for liquid milk by the processing industry, while also promoting quality, efficiency, and business viability along the value chain. The dual emphasis on farm-level productivity and value-chain development corresponds with the USDA Food for Progress (FFPr) strategic objectives of increased agricultural productivity (SO1) and expanded trade of agricultural products (SO2). Venture37 is implementing MERCADO project activities in the dairy-producing areas of the Beira corridor, including remote districts in Manica province, and the peri-urban areas of Beira city (Sofala province).

At midterm, the IMPAQ team conducted a performance evaluation to meet the evaluation objectives and answer the evaluation questions. Our mixed-methods approach frames the midterm evaluation through the lens of Mozambique's dairy market system, considering how MERCADO's interventions contribute to the development of a sustainable dairy market system driven by the private sector. Our inquiries at various levels of the value chain — dairy farmers, cooperatives, processors, student interns, and other stakeholders — paint a broad picture of MERCADO's relevance, impact, effectiveness, and efficiency and to examine the sustainability, and gender equity.

### Methods

The IMPAQ team organized the midterm evaluation using a mixed-methods approach, comparing progress on key outcomes over time for project participants. The midterm evaluation establishes a strong basis for the final evaluation by providing a comprehensive documentation of the Beira corridor's dairy market system. At midterm, we collected quantitative and qualitative data from a broad population of dairy value-chain actors. We used a non-experimental design, administering a longitudinal survey to collect quantitative data from 285 farmers who were beneficiaries of the MERCADO project. We also collected a repeated cross-sectional semi-structured survey with aggregation and value-addition facilities (cooperatives), processors, and dairy breeders. Further, we used focus group discussions to collect qualitative information from farmers and key informant interviews to collect qualitative information from other value-chain actors including cooperatives, processors, breeders, paravets, lecturers, student interns, government representatives, and project staff and partners.

Since we can examine only trends or changes in outcomes without a comparison group, we are unable to attribute the findings *causally* to the MERCADO project. That is, there could be other factors, such as other projects or government programs in the region, which could also contribute to these findings, and we are unable to disentangle the true impact of MERCADO. Thus, the findings in this report represent only

correlations between the MERCADO project and the outcomes. That being said, we used qualitative methods, to the extent possible, to provide insights into correlations between various MERCADO practices and desired outcomes such as quality and sales.

## **Findings**

We outline below the main impacts of the MERCADO project on: 1) farm scale and commercial viability, 2) knowledge and uptake of improved agricultural practices, 3) profitability and sales, 4) safety and quality, and 5) herd composition, production, and sales due to Cyclone Idai. We refer to *impact* here as only being relevant to the evaluation questions of the Development Assistance Committee of the Economic Cooperation and Development (OECD-DAC). The use of *impact* does not denote any causation as used in the report.

### ***Impact on Farm Scale and Commercial Viability***

- The total number of project beneficiaries declined from baseline to midterm. This reduction in the number of beneficiaries is in line with a major goal of MERCADO – to focus project activities on a fewer number of farmers who show a greater interest and capacity to eventually grow into medium- or large-scale farmers, thus ensuring a greater chance of sustainability after Venture37 no longer provides support.
- Among project beneficiaries who were present at both baseline and midterm, impact on scale for medium-scale farmers was promising. The proportion of medium-scale farmers increased from 6 percent at baseline to 13 percent at midterm. In line with MERCADO’s goal, the best medium-scale farmers (“grantees”) were prioritized with grants under the DHF in the last 12 months. Many small farmers are still being processed under the DHF to receive cattle due to supply side problems in the last 12 months including border closures due to foot and mouth disease in Mozambique.

### ***Impact on Knowledge and Uptake of Improved Agricultural and Management Practices***

- There has been an improvement in animal health testing for small farmers with more farmers testing for common diseases like brucellosis and mastitis than at baseline.
- Practices related to milking did not see a significant change from baseline to midterm. For instance, similar proportions of farmers used milking machines and stainless steel buckets in both rounds. There was a significant improvement in respondents citing Venture37 as a potential source for replacement for both milking machines and stainless steel buckets.
- More than half of medium-scale farmers at midterm used milk-chilling equipment. The most common source for replacement of milk chilling equipment was Venture37.
- In terms of grazing practices, there was a decline in zero-grazing. This is part of Venture37’s wider strategy of helping farmers find the most suitable grazing practice for their herd, as opposed to only promoting zero-grazing.
- There was a decline in the proportion of farmers giving their cattle feed, potentially because buying feed from the market is expensive. This was also borne out in the qualitative focus groups, where farmers expressed the desire to grow their own feed because of the high cost of feed.
- The two areas in which small farmers had high levels of knowledge were mastitis testing and milk quality and testing, which ties in with the results outlined above about improvements in animal health testing.
- Small farmers showed lower awareness in some improved dairy practices, such as ways to improve pasture quality and advantages of artificial insemination (AI), at midterm than at baseline. Possible reasons for low knowledge as highlighted in our qualitative interviews were lack of motivation, lack of continuous training and lack of regular use of these methods, especially Artificial Insemination (AI). As small farmers are not very well connected, they do not have many opportunities to learn about new practices and mostly rely on the training provided to them.

- While ease of access to health services improved significantly from baseline to midterm for small farmers, ease of access in other cases such as fodder, supplements, and breeding services, declined. As reported by farmers in the farmer survey, many are now seeking private providers for these inputs. This seems to be in line with Venture37's sustainability strategy wherein many farmers are now turning away from Venture37 as the main input supplier and relying more on private players, as was reflected in the farmer survey data.

### ***Impact on Production and Milk Sales***

- The daily volume of milk produced per cow decreased slightly, but not significantly, from baseline to midterm in both the rainy and dry seasons.
- The volume of sales made by all farmers also saw a slight decline overall from baseline to midterm. However, female farmers saw an increase in volume of sales in both the dry and rainy seasons from baseline to midterm. Small farmers saw an increase in volume of milk sales in the dry season. The value of milk sales followed a similar trend, with a slight overall decrease in sale value and increases in the dry and rainy seasons for female farmers and in the dry season for small farmers. These results suggest that MERCADO is providing greater benefits for the more vulnerable small-scale farmer and female farmer subgroups.
- Small-scale farmers retained significantly less milk for consumption by calves at midterm than at baseline. Instead, they significantly increased the share sold to cooperatives, across both dry and rainy seasons. There was no significant change in the amount of milk retained for own consumption in both the dry and rainy season.
- Most cooperatives and processors reported an increase in milk procurement due to their engagement with MERCADO, though the increase was not enough to enable them to break even.
- Similarly, over 80 percent of both cooperatives and processors said that their milk sales increased due to the project. However, they continued to cite low sales volumes as a binding constraint on profitability and expansion. Cooperatives and processors reported that this is primarily due to low production volumes by farmers, followed by transportation constraints in procurement in the rainy season.

### ***Impact on Safety and Quality***

- Midterm results on quality assurance practices were very positive.
- Farmers seemed more aware of the dangers of consuming milk from cows treated with injectable antibiotics. There was a significant reduction in the frequency of rejection of small farmers' milk for quality reasons. These trends suggest a transition to more quality assurance in the dairy industry.
- The quality checks and instruments used by cooperatives and processors varied. The most common quality checks were tests for mastitis, acidity level, and freshness.

### ***Impact of Cyclone Idai***

- Cyclone Idai had a devastating impact across the dairy value chain. A smaller share of small-scale farmers than medium-scale farmers lost cows due to the cyclone.
- Small-scale farmers faced a higher sickness rate after the cyclone. As a result, milk production fell.
- Unsurprisingly, housing for cattle was the dairy infrastructure most damaged by the cyclone. Damage to infrastructure generally made dairy inputs more difficult to access, though some farmers said there was no change after Cyclone Idai.
- Cooperatives and processors reported reduced milk procurement after the cyclone, with processors revealing significant losses. The damage to roads, grazing fields, and dairy infrastructure all served to weaken the supply chain, resulting in the observed procurement losses.

## Recommendations

The recommendations to Venture37, based on lessons learned in the field and findings from the midterm data, fall into three parts:

### Quick Wins

- **Provide training on strategies to help women-owned farms succeed.** Although women farmers had higher milk production than men, they indicated they were at a disadvantage because of their small herd sizes. Even as women are increasingly becoming the decision-makers and risk-takers in dairy farms, access to credit and capital is still a big constraint for them. Given that there is no specific women-centered approach as of now, we recommend that Venture37 *specifically* target women with trainings to help them overcome the constraints they face and become more commercial by expanding operations and adopting improved business practices. This could include targeting DIF grants to women. Further, the project could also sponsor gender-sensitivity trainings to show male partners how to support female farmers.
- **Continue MERCADO's policy work and increase focus on implementation.** MERCADO has been doing extensive policy work including facilitating a national dairy development strategy, forming a national dairy representative body, and developing appropriate dairy related legislations and regulations. As the project moves towards its final phase, we recommend that MERCADO should continue to work with the Mozambican government in strengthening regulatory frameworks around feed, medicine, and animal health. Given the nascent state of the dairy industry in Mozambique, especially the policy frameworks, this is extremely important. Additionally, we also recommend initiatives towards implementation and enforcement of these policies at the local level. These could include encouraging collaboration between the government and the educational institutions that Venture37 is working with to discuss mechanisms for better on-the-ground implementation of these policies. Further, we recommend encouraging collaboration with different ministries and departments within the government since they often have crosscutting mandates and interests, which are important for proper implementation. Finally, we recommend wide discussion of the policy measures being undertaken in the dairy industry at Dairy Focal Points to promote awareness among various stakeholders.
- **Continue to promote wider awareness of various grazing options.** Even though Venture37 scaled back its zero-grazing policy, many small- and medium-scale farmers at midterm continued to practice zero-grazing. This finding is particularly worrying because fodder use was also declining. Farmers who are still practicing zero-grazing but do not have the means to buy fodder are not able to give their cows adequate nutrition. We recommend putting additional effort to make all farmers aware of the scaling back of the zero-grazing policy through paravets and project staff. Additionally, these informants should also offer information on other alternative grazing practices promoted by Venture37 such as “semi-grazing” and growing one’s own fodder.
- **Increase transparency of the Dairy Innovation Fund (DIF) and Dairy Herd Fund (DHF).** Most stakeholders, from farmers to cooperatives and microprocessors, appreciated the DIF and DHF and reported that it is a very valuable project intervention. Project staff explained that the procedure for administering grants is advertised nationally through cooperatives and introductory meetings. However, some respondents indicated that distribution of funds is not transparent. We recommend making the grant process more transparent by frequently advertising the selection process for acceptance of applications and disseminating these criteria widely throughout the project period and not just at project launch.

- **Involve smaller beneficiaries and stakeholders in the implementation of project activities.** The main beneficiaries of the project – small farmers and cooperatives – expressed the feeling that they do not get a full seat at the table. Smaller farmers expressed the desire to coordinate with Venture37 in determining which activities are offered and how. As the project moves into its final phase, we suggest including farmers’ associations and cooperative members so that smaller farmers can provide valuable information on their needs and needs of their community after MERCADO ends. Since the eventual goal of the project is to transition these small farmers into medium-scale and thereafter focus on medium-scale farmers, it is important to involve them in the planning and implementation stages.

### ***Medium-term Strategy***

- **Continue to encourage commercial investments at various levels in the dairy sector.** Since MERCADO will now enter its final implementation stage, we recommend continuing to encourage commercial investments at various levels in the dairy value chain. This includes three key components. First, on the input side, we recommend encouraging local commercial mills to collaborate with universities and develop affordable concentrate feed. Further, we recommend encouraging commercial retail sector players such as agro-vets and agro-dealers to begin handling feed, thereby expanding the distribution network of animal feed. To encourage private players to enter the market, we recommend working with the provincial governments to facilitate tax breaks and other incentives for these private agri-businesses. Second, on the milk aggregation side, since there is low political will for shifting ownership of dairy processing plants to private sector investors, we recommend instead encouraging a public-private partnership model wherein both the private and public sector are jointly involved in management. Finally, we also recommend working with the government to encourage private and public sector investment in transportation services since lack of transportation options and poor road conditions was a key constraint outlined by most project beneficiaries.
- **Scale down the dairy demand campaign and continue to expand sales of local milk.** Through our quantitative surveys, we found that at midterm there is insufficient supply to meet the demand. This was also revealed in the Special Study on “Assessment of Opportunities for Alternative Aggregation Models for Dairy Industry Growth in Mozambique”, wherein it was found that demand continues to outstrip supply, which increased the reliance on imported products.<sup>1</sup> Thus, as the project moves towards its final phase, we recommend capitalizing on the increased demand for local milk created through MERCADO’s dairy demand campaign by scaling down the campaign and instead focusing on the supply side for the remainder of the project period. This includes four components. First, shifting focus towards the packaging, marketing, and branding of local milk and milk products as these are major barriers for local processors. Second, increase production volumes by continuing to transition more small farmers to medium-scale through the DHF to meet the high demand for milk. Third, we recommend continuing to increase the milk processing capacity of microprocessors by continuing to give them DIF grants to help grow their business. Finally, this involves expanding sales of local milk and milk products at the retail level by facilitating relationships between cooperatives, processors and small and mid-sized retailers.
- **Continue to increase production volumes.** At midterm, findings from this study point to consistently low levels of sales by small dairy farmers who form the bulk of the project

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<sup>1</sup> MERCADO Special Study. Assessment of Opportunities for Alternative Aggregation Models for Dairy Industry Growth in Mozambique, November 2018.



beneficiaries. For key performance indicators on volume and value of sales, at midterm, only a small fraction of the life of project target was met. Given that, with respect to volume of production *per cow*, the project seems to be on course to meet its life of project target, the key constraint to increasing the scale of operations appears to be increasing overall production volumes by increasing the number of cattle owned by farmers. As the project moves towards its final phase, increasing production volumes should form the most important component of the sustainability strategy of MERCADO. In this regard, we recommend the following:

- Making Gate 2 of the DIF more accessible. During qualitative focus groups, farmers reported that the current requirement of Gate 2 wherein 50 percent of the investment has to come from the project beneficiary is too onerous. Given that the project urgently needs to transform more small farmers into medium-scale farmers, we recommend making the allocation of Gate 2 to lower than 50 percent, with the exact allocation being decided in consultation with project beneficiaries. This will encourage more small farmers to apply for DIF grants and help transform them into medium-scale farmers.
  - Continuing to allocate resources by focusing on the *most efficient* small farmers who show great potential with the goal of generating more medium-scale farmers. Those farmers who are most willing to be integrated into the value-chain should be prioritized. MERCADO staff at the provincial level, including monitoring and evaluation specialists and field extensionists can work with the leadership of the cooperatives and farmers' associations to identify promising farmers who show the interest, motivation, and capacity to be successful in dairy production. Investing in such farmers is in line with the goal of MERCADO and would be more effective than distributing resources to farmers who may not have the capability to capitalize on the resources the project provides.
- **Improve market access for dairy farmers.** Many farmers discussed challenges in physically accessing buyers due to poor transportation conditions and lack of access to reliable transportation to carry milk. Additionally, the quantitative data show that MERCADO only marginally increased access to buyers. Poor transportation conditions often lead to milk going bad quickly. Thus, we recommend continuing to ensure milk collection points are within two hours of each farmer and ensuring milk-chilling equipment is available for each farmer, both of which are already being done by Venture37.
- **Continue to provide training in record keeping and management.** Most farmers reported keeping records of milk production, but less than half keep records on animal feeding and animal health. Monitoring the relationship between inputs (feed, medicines, care) and outputs (production and health) is a critical component of a successful farm. We recommend continuing to provide training on record keeping, with a focus on *why* and *how*, so farmers can use their records as a tool for managing their herds.
- **Provide training in marketing and sales.** Most cooperatives and processors reported that they were more professional and sustainable due to the training provided by the MERCADO project. However, businesses felt that lack of knowledge of sales and marketing was a roadblock in achieving their economic potential and resulted in lower levels of growth. We recommend providing training on sales and marketing to help interested businesses improve their net cash flow and strengthen their market linkages. Such training would be particularly useful for

microprocessors, who struggle to remain viable in the face of large monopolies of one or two processors.

- **Promote transparency in pricing.** Most farmers and cooperatives noted a lack of price differences based on quality. Farmers in both Manica and Sofala, reported that, in most cases, the price of their milk was based not on bacteria content on the day the milk was brought in, but on the prices they had received in the past. Cooperatives reported that processors primarily used milk testing for quality control and did not implement price different based on quality. This was in contrast to the views of large processors in Manica who reported in qualitative interviews that they had a quality based payment system. Given the varying views regarding how milk is priced, we recommend promoting a more transparent quality based pricing system among the existing processors. A more transparent pricing system would instill more trust among players in the dairy sector by reducing uncertainty. Venture37 should work with cooperatives and large processors to encourage them to adopt (if not already adopting) and implement well (if already adopting) a clear differential pricing strategy for milk quality. Reducing arbitrariness in pricing will benefit all players in the dairy sector in the region.

### **Long-Term Strategy**

- **Facilitate increased credit access for project beneficiaries.** Currently, there is heavy reliance of project beneficiaries on the in-kind and cash grants given through the DHF and DIF. With a view to ensuring long-term sustainability, we recommend steps towards increasing credit access among project beneficiaries. This could include:
  - Transitioning the DHF and DIF into a facility managed by banks and microfinance institutions. This would involve leveraging existing microfinance institutions in the area and transitioning the DHF and DIF to them for the remainder of the project period. This will develop trust between project participants and these local banks and microfinance institutions. This will be crucial for future lending prospects of project beneficiaries' post-MERCADO.
  - Continue reaching out to local agri-businesses and agricultural lending institutions in the area including Agricultural Development Fund (FDA), District Development Funds (FDD), Agriculture Promotion Centre (CEPAGRI), Cabinet for Promotion of Investment (CAPI), Investment Promotion Centre (CPI), and Institute for Promotion of Small and Medium-scale Enterprises (IPEME), and encourage them to provide input credit and short-term loans to project beneficiaries.
- **Facilitate an increase in prices for milk received by farmers and cooperatives.** One of the main challenges that emerged from both quantitative and qualitative findings is that dairy farmers found it difficult to make their enterprises profitable because they received low prices from processors and cooperatives. Therefore, we believe that increasing the price paid to farmers will increase production by farmers and procurement in the formal market. We suggest three options for helping farmers and cooperatives receive better milk prices:
  - Venture37 can promote transparency in pricing as outlined above by encouraging cooperatives and processors to clearly implement a differential pricing strategy based on milk quality. This will reduce arbitrariness in pricing, benefiting all players in the dairy sector in the region.
  - Venture37 should continue to help strengthen local cooperatives and provincial unions formed by small- and medium-scale farmers, which can improve their bargaining power, so they receive better prices. In many countries, small dairy farmers have successfully

achieved fairer prices by forming farmers' groups for collective bargaining.<sup>2</sup> This could also include training small- and medium-scale farmers on price negotiation.

- o Venture37 can continue its work towards reducing the monopoly of large processors and encouraging microprocessors to expand through increased DIF grants and encouragement of private investors.

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<sup>2</sup> [https://emnet.univie.ac.at/uploads/media/Grashuis\\_Cook.pdf](https://emnet.univie.ac.at/uploads/media/Grashuis_Cook.pdf)

## SECTION 1. INTRODUCTION

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Land O'Lakes Venture37 (Venture37) has contracted with IMPAQ International, LLC (IMPAQ) to implement the evaluation of the five-year Mozambique Expansion of Rural Cattle and Dairy Opportunities (MERCADO) project, funded by the United States Department of Agriculture (USDA). The evaluation consists of three components: baseline and gender analysis (2016), midterm (2019, the focus of this report), and final (2021) evaluations. The purpose of this midterm report is to measure progress made in achieving the intended outcomes from baseline.

**Section 1** provides background on the dairy sector in Mozambique, describes the MERCADO project, and presents an overview of the results framework and specific project activities. **Section 2** describes the midterm evaluation methodology including midterm evaluation objectives, research questions, data sources, sampling and data collection tools, data analysis methods, field implementation, and data collection challenges. **Section 3**, **Section 4**, and **Section 5** present the midterm quantitative and qualitative results from farmers; cooperatives, processors, and breeders; and additional stakeholders. **Section 6** describes the gender analysis and examines women's participation in the dairy industry in Mozambique. **Section 7** concludes the report by outlining limitations of the evaluation and offering recommendations based on the key findings and conclusions of the midterm evaluation. We present the indicator table for the project, with finalized midterm values, in **ANNEX A**.

### 1.1 Overview of Mozambique's Dairy Sector

Historically, Mozambique had a well-developed dairy sector and had significant milk production. In 1973, Mozambique reached its peak number of dairy cows and amount of milk production, with 13,200 cows and over 13 million kilograms of milk produced annually. The important contribution of dairy production to the livelihoods of smallholder dairy producers is well documented.<sup>3</sup> Between 1970 and 1980, the development of the dairy industry in Mozambique was accompanied by the establishment of milk collection points to facilitate the collection of milk from smallholder producers. This played a fundamental role in the promotion of milk production in rural families and there was a perception that milk could be a significant source of income for the community.<sup>4</sup>

However, privatization and the later disruption to economic life resulting from civil war caused a considerable drop in milk production and resulted in a much-weakened dairy sector.<sup>5</sup> Currently, official statistics place the number of dairy cows at 2,209. Of those cows, 80.4 percent are in the provinces of Sofala and Manica.<sup>6</sup> The country is almost completely dependent on imports for milk and milk products because of the decline in number of dairy cows and poor management of dairy production. In 1992, the contribution of the national production to the total milk and dairy products consumed was 6.0 percent, a figure that, 20 years later, is largely unchanged at 6.4 percent.<sup>7</sup> Various attempts were subsequently made to revive and to develop milk production and processing in the early 2000s, but, for a variety of reasons, these failed to sustainably revive the sector.<sup>8</sup> For instance in the early 2000s, the contribution of dairy to gross domestic product (GDP) as a livestock component was still not significant, although the livestock sector contributed 14.8% to the agriculture GDP and 4.4% to the total GDP (FAO, 2005).

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<sup>3</sup> Mozambique Dairy Development Program Baseline Evaluation, June 2013.

<sup>4</sup> Mozambique Dairy Development Program Midterm Evaluation, March 2015.

<sup>5</sup> Mozambique Dairy Development Program Final Evaluation, November 2016.

<sup>6</sup> Venture37 MERCADO Baseline, Midterm, and Final Evaluation Terms of Reference (Updated); December 6, 2016; pg. 1.

<sup>7</sup> Ibid; pp. 1.

<sup>8</sup> MERCADO Special Study, Barriers to Growth, 2017.

For the dairy sector, the Government's vision is to resuscitate the industry and become self-sufficient in dairy production and processing. A ten-fold growth in production over the next 10 years would bring local production to over 20 million liters and the herd size back to around 13,000 cows.<sup>9</sup>

## 1.2 Previous Venture37 Projects in Mozambique

Since 2008, Venture37 has led the revival of the Mozambican dairy industry, leveraging USDA Food for Progress funding to build a supply base and distribution system for domestically produced milk. These efforts have facilitated capacity building, market linkages, and financial investments that are essential for sustaining the development of a socially inclusive yet market-driven industry.

The Strategic Plan for Dairy Development in Mozambique and government interventions identify the Beira corridor as a priority location in which to reestablish dairy production in the country. The peri-urban areas of Beira and Chimoio cities, in which Venture37 is reestablishing dairy production, are the same areas in which dairy farms were concentrated previously.<sup>10</sup> Prior to MERCADO, in support of the Government of Mozambique's vision, USDA invested in two dairy projects implemented by Venture37 since 2009.

- **Manica Smallholder Dairy Development Program (MSDDP) 2009-2012.** MSDDP focused on establishing a small cohort of smallholder dairy farmers in Manica, a province with little smallholder dairy activity prior to USDA investment. By the end of the project, Venture37 demonstrated that dairy could be a viable enterprise for smallholder farmers and interest in the sector started to grow.
- **Mozambique Dairy Development Program (MDDP) 2012-2016.** Building on the success of MSDDP, the MDDP kicked off in 2012 to expand the model from a single Chimoio-based hub, to two additional hubs in Sofala and Maputo. The MDDP project took a broader value-chain approach using matching grants to support small and medium-scale producers and small, medium-scale and larger processors and to leverage private sector and local financial sector investment in dairy. As a result of MDDP assistance, dairy became a promising business and attracted new investments in the intervention areas in Manica and Sofala provinces. All these investments promoted the production of milk for both large and small farmers and therefore increased the number of jobs created. As a result, the volume and value of milk processed, meeting international standards, observed a substantial increase.<sup>11</sup>

MSDDP and MDDP significantly revived dairy production especially in the central Manica and Sofala provinces. The 2010/2015 national herd growth based on the number of cows increased by 41 percent with the MDDP project contributing 54% of this increase with its cow imports. The national pure breed dairy cow herd in 2015 was estimated at 2,304 head, of which some 1,900 were located in Manica and Sofala.<sup>12</sup> The total production of milk from these dairy animals was estimated at 2,268,700 liters, with the majority produced in Manica and Sofala followed by Gaza and Maputo. The three provinces of Maputo, Sofala, and Manica represent some 87% of the national herd (1,927 cows out of 2,209). In 2015, the production of milk in these provinces accounted for 78% of the total milk produced in Mozambique.

At the end of MDDP, in 2017, domestic dairy sector in Mozambique still faced many challenges. The dairy industry was at a critical point in its development and its future survival in the context of dominant and

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<sup>9</sup> MERCADO Special Study. Impact of USDA Investment, March 2017.

<sup>10</sup> Ibid; pp. 1-2.

<sup>11</sup> Mozambique Dairy Development Program Final Evaluation, November 2016.

<sup>12</sup> MERCADO Special Study. Impact of USDA Investment, March 2017.

growing imports of dairy products. The lack of scale in dairy cattle and milk production was hindering growth in the development of inputs and services as well as in the development of modern processing facilities. The milk market, while relatively small in comparison with other Sub-Saharan African countries, was composed of a significant formal market, principally in the urban areas, that is dominated by imports. Simultaneously, an undefined informal market was operating in peri-urban and rural areas and comprised of both local and imported products. Local market players faced a significant number of obstacles or barriers to growth and development throughout the value chain. These included sub-optimal inputs (access to feed, breeding, machinery, parts/consumables); low milk production (herd size, yields, quality), poor logistics (collection, distribution, points of sales); and underdeveloped supporting services (veterinary services, quality infrastructure, distribution and marketing).<sup>13</sup> In this context, the third USDA funded MERCADO project was initiated. We describe the main project components in detail below.

### 1.3 Venture37 MERCADO Intervention and Results Framework

The USDA-supported MERCADO project is Venture37's third Mozambican dairy sector development initiative. The five-year project began in October 2016 and seeks to address critical weaknesses that currently impede or threaten the competitiveness and sustainability of the dairy market system. MERCADO uses a private-sector-driven market systems approach to attempt to establish a commercial-oriented, sustainable and competitive dairy market system in Mozambique that can be competitive locally, regionally, and nationally. To accomplish this goal, the project works to increase dairy productivity and quality at the farm level to help meet unmet demand for liquid milk by the processing industry, while also promoting quality, efficiency, and business viability along the value chain. The dual emphasis on farm-level productivity and value-chain development corresponds with the USDA Food for Progress strategic objectives of increased agricultural productivity (SO1) and expanded trade of agricultural products (SO2). Venture37 is implementing MERCADO project activities in the dairy-producing areas of the Beira corridor, including remote districts in Manica province, and the peri-urban areas of Beira city (Sofala province) (see **Exhibit 1**).

MERCADO's results framework (see **ANNEX B**) links project activities and outputs with desired outcomes and project-level results. The causal logic underlying MERCADO's results framework posits that facilitation of training, equipment, and inputs among dairy value-chain actors will increase their knowledge and productive capacity to produce and add value to quality milk products, while simultaneous improvements to the market (in particular, prices, market terms, and local demand) will increase their motivation to do so. These changes will also lead to increases in the volume and quality of dairy farmer's milk and subsequently improve quality along the value chain. Together, increased volumes and quality of production will enable the emergence of a competitive, profitable, and sustainable dairy market system.

To improve the productivity of dairy cows, MERCADO is improving the quality and availability of inputs such as animal health services, extension services, feed and fodder, and dairy equipment, in the process

**Exhibit 1. Target Provinces of MERCADO Project**



<sup>13</sup> Mozambique Dairy Development Program Final Evaluation, November 2016.



improving the capacity of dairy farmers to care for their animals. To improve input quality and availability, MERCADO is retraining previously trained community livestock workers (CLWs or paravets) to provide services to the dairy farmers. MERCADO is also continuing to provide updated curricula and internships for students at local technical institutes who are interested in entering the dairy sector. The project is working with agro-businesses, including feed and fodder producers and other input providers, to increase their capacity and facilitate access to finance to start or grow their businesses.

To improve the capacity of dairy farmers, MERCADO supports technical and farm management capacity building to dairy farmers to improve their dairy and farm practices. It is also facilitating access to finance to help farmers purchase livestock and infrastructure for production and trade, promoting private investments in the dairy sector, and strengthening linkages between buyers and sellers.

In combination with increases in productivity and quality at the farm level, the project is providing training, capacity building, and financial services that will improve quality and productivity all along the dairy value chain. The project also recognizes that, in the face of unmet demand, dependence on relatively few large-scale commercial milk processors makes farmers and other value-chain actors vulnerable to disadvantageous price and market conditions. In this context, the project seeks to increase diversity and competition along the value chain by promoting the entry of new market actors, particularly at the processing level, while also promoting appreciation of, awareness of, and demand for local milk among consumers.

MERCADO is undertaking seven activities within three separate focus areas: financial services, training, and capacity building of farmers, extension workers, input and service providers, and post-farm value-chain actors. We summarize these activities in **Exhibit 2** and below.

**Exhibit 2. MERCADO Project Activities**

| Activity Focus Area       | Activity Description                                                            |
|---------------------------|---------------------------------------------------------------------------------|
| <b>Financial services</b> | 1. Facilitation of investment in dairy herd restocking                          |
|                           | 2. Facilitation of investment in the dairy sector via the Dairy Innovation Fund |
| <b>Training</b>           | 3. Improved farm practices                                                      |
|                           | 4. Improved post-harvest handling, food safety, and quality                     |
| <b>Capacity building</b>  | 5. Agricultural extension agents/services                                       |
|                           | 6. Aggregation and value addition                                               |
|                           | 7. Promotion of improved policy and regulatory framework                        |

**Activity 1. Financial Services: Facilitate Investment in Dairy Herd Restocking**

Venture37 is continuing to restock the Mozambican dairy cattle herd by importing dairy cattle and establishing a Dairy Herd Fund (DHF) to enable enterprise-minded farmers to access capital to purchase both imported and local dairy cattle. Commercial breeders can also access this fund to expand their dairy herds and to invest in appropriate reproduction techniques to reduce the need for imported cattle in Mozambique. Venture37 is using the DHF to provide in-kind grants using a scaled match component.

**Activity 2. Financial Services: Facilitate Investment in the Dairy Sector via Innovation Fund**

Venture37 has developed a Dairy Innovation Fund (DIF) that entrepreneurs, including input and service providers, producers, processors, and retailers, can access to finance equipment, infrastructure, and other innovations to expand their businesses. Venture37 will also identify entrepreneurs in input or service provision and link them to the DIF or financial institutions to access finance to develop and grow their enterprises. Venture37 uses the DIF to administer in-kind grants using a scale match component.

### ***Activity 3. Training: Improved Farm Practices***

Venture37 is building the capacity of dairy farmers to improve animal health and nutrition and their own farm business acumen to increase milk production and herd growth. Venture37 is providing ongoing support and guidance to dairy farmers on improved feeding and use of appropriate technologies, including fodder production and animal nutrition. Additionally, Venture37 is providing training to dairy farmers on husbandry, including topics such as breeding, mastitis control, hygiene, and animal health. Venture37 is also training farmers in farming as a business, including facilitating linkages between farmers and technology, input, and service providers.

### ***Activity 4. Training: Improved Post-Harvest Handling, Food Safety, and Quality***

Venture37 is helping to improve post-harvest handling to decrease post-harvest loss, focusing on the cold chain from production to retailers. Venture37 has identified weaknesses in the cold chain to design appropriate training for farmers, cooperatives, and processors on post-harvest handling, including topics such as hygiene, quality control, processing, and awareness of zoonotic diseases like brucellosis and tuberculosis. Venture37 is providing technical support to processors, who are providing training on post-harvest handling, food safety, and quality to cooperatives.

### ***Activity 5. Capacity Building: Agricultural Extension Agents/Services***

Venture37 is working with educational institutions, processors, cooperatives, and other input providers to make dairy extension services available to farmers. Venture37 is supporting educational institutions to build a cadre of professionals in the dairy sector, through activities such as integrating dairy into current livestock and veterinary curricula, setting up demonstration farms for training, and facilitating dairy internships. Venture37 is continuing to support community paravets who are providing guidance and veterinary services to dairy and livestock farmers. It is also facilitating linkages between the paravets and private or government veterinary services. It is supporting processors, cooperatives, and other businesses interested in developing appropriate support services and inputs to farmers. Venture37 is also supporting the establishment of local breeders to provide an in-country supply of dairy cattle. This support is building their dairy breeding skills and helping them explore the effectiveness of various breeding technologies.

### ***Activity 6. Capacity Building: Aggregation and Value Addition***

Venture37 is increasing market access by supporting milk bulking and value addition in local businesses. It is working with existing milk bulking businesses, such as cooperatives, to enhance growth and profitability. It is also exploring and implementing alternative milk bulking models, such as working with dairy farmers, private businesses, and processor-owned bulking facilities. Venture37 is supporting these businesses to expand into areas such as cold chain management, processing, and retail opportunities. These opportunities could include developing transport systems, purchasing processing equipment to process the milk on site, and creating milk kiosks to sell directly to customers. Venture37 is training youth on nutrition, food safety, and dairy quality to promote consumption of dairy products. It is facilitating a marketing campaign to stimulate alternative markets through promotion of locally produced milk products.

### ***Activity 7. Capacity Building: Promotion of Improved Policy and Regulatory Framework***

Venture37 and key dairy sector stakeholders, including dairy producers, cooperatives, processors, input and service providers, and private sector investors, are working with the government to examine the current policy and regulatory framework in order to identify barriers to growth in the dairy industry and recommend effective solutions. Based on the results, Venture37 is supporting capacity building and networking opportunities for key government staff and other stakeholders to increase their ability to strengthen the Mozambican dairy sector. Through a consultative process, Venture37 is facilitating the

development of a private-sector-led representative body for the dairy sector to support the needs of the dairy industry, including helping this body to develop its mission statement and strategy. The entity is engaging the government of Mozambique to advocate for reforms in the policy and regulatory framework to support growth and investment in the dairy sector.

### **1.3.1 MERCADO's Policy Interventions**

While Venture37 has always ensured that their activities and strategies are consistent with the priorities of the Government of Mozambique, a key component of the MERCADO project as compared to Venture37's previous projects in Mozambique is the addition of capacity building activities with the government to promote the country's policy and regulatory framework. This entails working with key value chain actors in the dairy sector, including producers, cooperatives, processors, input and service providers, private sector investors, and the government to examine the current policy and regulatory framework to identify barriers to growth in the dairy industry and recommend effective solutions.

In this context, MERCADO has a dedicated policy officer who supports key government staff and key dairy value chain actors to increase their ability to strengthen the Mozambican dairy sector. By focusing on both the government and the private sector, the project is laying the groundwork for a sustainable industry where gains will continue after MERCADO ends. In particular, Venture37 is working with the National Veterinary Directorate (DINAV) of the Mozambican Ministry of Agriculture. The main goal of the DINAV is to establish a viable dairy sector in the country. They are starting from the ground up to lay a national foundation, as there were no national policies related to the dairy industry in place prior to MERCADO. To do so, Venture37 is supporting three crucial efforts. The first is the development of a national dairy development strategy, which clearly outlines and structures the priorities of the government and the steps needed to organize the industry. The second is the establishment of a national representative dairy board, comprising of the actors along the value chain. Finally, Venture37 is supporting the development of legislation and regulations, including around livestock health, livestock feed, medicine, and milk collection, refrigeration and bulk transport. They are in the early stages of developing standards for manufacturing plants/processors.<sup>14</sup>

In addition to helping draft legislation, Venture37 has supported several other capacity-building activities for the government, including a networking visit to Zambia where government representatives and other representatives from the dairy value chain learned firsthand about the neighboring country's successful national dairy board and dairy policies.

### **1.3.2 MERCADO's Work on Demand Creation**

Along with working towards increasing the supply of milk in Mozambique, there has also been a focus on *"creating a demand shift for quality domestic dairy products"*. Increased demand will likely match the increased supply of milk and avoid any glut or reduction in milk prices received by local producers. In order to create a demand for domestic dairy products, Venture37 has trained youth at educational institutions on nutrition, food safety and dairy quality to promote consumption of dairy products. Concurrently, Venture37 is conducting an awareness campaign to stimulate alternative markets through promotion of locally produced milk products.<sup>15</sup>

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<sup>14</sup> Interviews with DINAV representatives and Venture37 project staff; MERCADO Semi-Annual Performance Report, April 2018 – September 2018; MERCADO Semi-Annual Performance Report, October 2018 – March 2019

<sup>15</sup> MERCADO Life of Project Work Plan Year 1, 2016.

In Year 1 of the MERCADO project, the demand creation focused on developing training materials in order to train youth on nutrition, food safety and dairy quality to promote consumption of dairy products. Additionally, Venture37 developed marketing campaign materials for use in a marketing campaign. The marketing materials focused on stimulating alternative local markets and making domestic products more attractive to consumers, through promotion of locally produced milk products.<sup>16</sup>

In Years 2 and 3, Venture37 along with private players ran a series of consumer campaigns combined with the training of youth on health benefits of local milk and milk products in schools in strategically located communities along the Beira Corridor. In Year 3, MERCADO trained close to five hundred youth, teachers and staff on the nutritional value of milk products and the type of milk products that are safe to consume in schools in two schools in Sofala.<sup>17</sup> Venture37 estimates that the dairy demand campaign reached around 1400 consumers in Sofala province. Similarly, by Year 3, Venture37 estimates that the dairy demand campaign has reached 718 participants in two schools in Manica province. The events in Manica were led by local processors to market their products with the assistance of the project. According to Venture37, large processors involved with the project and two microprocessors have also been directly involved in the youth dairy marketing campaign in Manica, focusing on school children and teachers. When compared against the target for training for Year 3, according to Venture37's estimates, the MERCADO project has achieved 67% of the target at the midpoint of the project year.<sup>18</sup>

### **1.3.3 MERCADO's Role in Commercialization of the Dairy Sector**

In addition to MERCADO's policy work and its work on demand creation, the project has also focused on commercialization of the dairy sector in Mozambique and worked with several players (farmers, processors, cooperatives) in the dairy sector to improve their commercial viability.<sup>19</sup> Commercial dairy farming has the potential of providing better incomes to farmers, which translates into reduced poverty and significant improvements in the standard of living of project beneficiaries. Commercialization of dairy farming is especially beneficial for small farmers who mostly depend on subsistence farming. Further, commercialization has the potential to increase the local dairy production, allowing local consumers to buy the locally produced dairy products at a reasonable price, while reducing dependence on imports. This is not only likely to generate employment in dairy sector, but also save on import costs.

In this context, to improve the commercial viability of the dairy sector, according to Venture37, MERCADO has provided technical support to all dairy sector players, and helped them in developing and improving milk supply chains. At the start of MERCADO, significant challenges included disorganized markets, limited skills to maintain high quality milk, low market infrastructure to support development of successful a dairy sector, and inefficient contractual arrangements between dairy farmers, milk collectors, cooling centers and processors.<sup>20</sup> To combat these challenges and increase the commercialization of the dairy sector, according to Venture37, MERCADO has provided training on hygienic milk handling, worked with private players towards establishment of milk bulking facilities and other infrastructure, and worked towards improving trust and contractual agreement between dairy farmers and their buyers. Based on Venture37's semi-annual performance reports, this has potentially reduced some transaction costs, and

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<sup>16</sup> MERCADO Life of Project Work Plan Year 1, 2016.

<sup>17</sup> MERCADO Semi-Annual Performance Report, April 2018 – September 2018

<sup>18</sup> Ibid.

<sup>19</sup> Proposal Introduction and Strategic Analysis, Land O' Lakes Mozambique Food For Progress FY 2016

<sup>20</sup> MERCADO-Mozambique Dairy Sector – Barriers to Growth, 2017

improved participation of farmers in the formal dairy supply chain, increased the size of the domestic dairy sector, improved the quality of milk, and reduced milk spoiling due to unhygienic conditions.<sup>21</sup>

Prior to MERCADO, cooperatives and processors in the region had limited commercialization skills in production handling, food safety and quality. As reported by Venture37 in their semi-annual reports, MERCADO has provided them training on improved postproduction handling, food safety and quality in 2018, which has helped them improve their business. According to Venture37, these trainings have helped reduce their inefficiencies and transaction costs and are helping make these businesses more financially viable and sustainable.<sup>22</sup>

Finally, Venture37 has also provided a variety of technical support to dairy farmers in order to improve their productivity and quality of milk. In order to sustainably produce high quality milk for commercial purposes, farmers need to follow numerous practices such as checking and reducing diseases among cows, vaccinating dairy cows, providing better nutrition to the dairy animal, following standard practices of cleanliness of the kraal, zero-grazing, keeping milk records, and AI among others.<sup>23</sup> In Year 3 of the project, Venture37 reported providing trainings and demonstrations to disseminate information about benefits to improving breeds through AI, benefits from animal registration, improved husbandry and dairy enterprise management practices, improved fodder production and management, supplemental feed use, and animal diseases and disease management.

## **1.4 Cyclone Idai and MERCADO**

In March 2019, during the implementation of MERCADO, Cyclone Idai — one of the worst tropical cyclones to affect the Southern Hemisphere — caused catastrophic damage in Mozambique, Malawi, and Zimbabwe. The cyclone severely affected both the Sofala and Manica provinces. In Sofala province, the districts of Beira, Dondo, and Nhamatanda were the most impacted by the cyclone's strong winds, heavy rainfall, and ensuing flooding. The cyclone had a catastrophic impact on residents and caused immediate and long-term damage to livestock assets.

### **1.4.1 Economy Wide Impact of Cyclone Idai**

Cyclone Idai, which made landfall in eastern Mozambique on March 14, 2009, was the worst natural disaster to hit southern Africa in two decades. The cyclone damaged critical infrastructure, destroyed as much as 50 percent of Mozambique's annual crops, and killed more than 500 people.<sup>24</sup> Cyclone Idai has directly affected aggregate supply through the destruction of productive capacity, mainly in agriculture, trade, transport, manufacturing, and services. The preliminary forecast points to a slowdown in real gross domestic product (GDP) growth to 2.5% in 2019, compared with a planned growth of up to 4.7% in 2019. Further, the preliminary data available suggests that there will be less pronounced growth in agriculture (including animal husbandry). The growth of the agricultural sector is expected to fall to 2.0% in 2019, compared to 3.5% in 2018.<sup>25</sup>

Cyclone Idai has also impacted poverty and livelihoods in Mozambique. In Mozambique, 66% of its 28 million people live in rural areas, where basic services are very scarce and material deprivations were

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<sup>21</sup> MERCADO Semi-Annual Performance Report to USDA October 2018 to March 2019

<sup>22</sup> Ibid pp 9-31

<sup>23</sup> MERCADO Semi-Annual Performance Report to USDA April to September 2018

<sup>24</sup> Brookings Institution, 2019.

<sup>25</sup> Mozambique Cyclone Idai Post Disaster Needs Assessment, UNDP, May 2019.

already high even prior to Cyclone Idai.<sup>26</sup> The impact of Cyclone Idai on housing, water and sanitation facilities, and health and education has increased material deprivations and will have longer-term effects on the levels of poverty in the country. For instance, over USD 39 million in income was lost due to unemployment after Idai; 240,000 households had their homes totally or partially destroyed; 211,000 people have restricted water access; 433,056 farming families require seed starter kits; 1,359,159 individuals require emergency food assistance; and food consumption of staples such as cassava has been reduced by over 50%.<sup>27</sup> Most income sources were disrupted as the majority of households earn income by selling crops and livestock, which were affected by the cyclone. However, in flood affected areas, particularly in parts of Sofala and Manica provinces, the above average harvest of horticulture crops, such as, cabbage, lettuce, carrots, and some tubers such as sweet potatoes is improving food access in the short-term.<sup>28</sup> Most poor households are increasing their engagement in self-employment activities to access income and nonfood expenditure. However, as more households engage in self-employment activities, opportunities to sell decrease, as do prices as the result of increased competition, limiting incomes. In Sofala and Manica provinces, recovery efforts have been slow and the affected households not receiving humanitarian assistance continue to use coping strategies including reducing the frequency and quantity of meals, relying on less expensive foods, borrowing food from relatives or better off households, and consuming less preferred and non-recommended wild foods in excess.<sup>29</sup>

As evidenced by our findings and through a document review of the wider impacts in Mozambique, supply of milk was severely impacted by Cyclone Idai. The supply of milk was impacted in two ways. On the one hand, many animals died as a result of the cyclone. Preliminary estimates from the Government of Mozambique suggest that 372 milking cows and 260 other cattle in Manica and 2,690 milking cows and 2,142 other cattle in Sofala died as a result of Cyclone Idai. In terms of value, out of the total value of 31 million metical of lost animals, 50% were from Sofala, 14% for Manica, and the rest from other provinces.<sup>30</sup> On the other hand, the animals that survived were affected by the total lack of pasture or low quality pasture, spoiled fodder/feed, poor quality drinking water, as well as the higher probability of animal disease outbreaks. In addition to dip-tanks, animal watering points and the associated boreholes, a large number of poultry farms and livestock stables were totally or partially destroyed. Also, some quantities of animal feed/fodder and an assortment of veterinary drugs and equipment stored at the farm level were lost. The damages in livestock infrastructure and goods are estimated at 870 million metical in all of Mozambique, and Sofala accounts for more than 86% of the total.<sup>31</sup> Finally, on the demand side, while there is no documented evidence on the impact of Cyclone Idai on milk demand, low purchasing power in the aftermath of Cyclone Idai as described above could directly affect demand for dairy products, among other food items.

#### **1.4.2 Cyclone Idai's Impact on MERCADO**

As discussed above, the cyclone severely affected both the Sofala and Manica provinces. In Sofala province, the districts of Beira, Dondo, and Nhamatanda were the most impacted by the cyclone's strong winds, heavy rainfall, and ensuing flooding. The cyclone had a catastrophic impact on residents and caused immediate and long-term damage to livestock assets. Based on the project estimates, an estimated 87

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<sup>26</sup> World Bank Mozambique Poverty Assessment, 2019.

<sup>27</sup> Post Cyclone Idai Cabinet for Reconstruction, Government of Mozambique, May 2019.

<sup>28</sup> This is likely from second cropping season, in which planting starts in mid April and harvest begins around mid July. Note that all these crops are horticulture crops and therefore likely to have shorter growing period.

<sup>29</sup> FEWSNET Mozambique, August 2019.

<sup>30</sup> Post Cyclone Idai Cabinet for Reconstruction, Government of Mozambique, May 2019.

<sup>31</sup> Post Cyclone Idai Cabinet for Reconstruction, Government of Mozambique, May 2019.



dairy cattle under the auspices of the MERCADO project were lost in Sofala (50) and Manica (37) during or in the immediate aftermath of the cyclone; in Sofala the loss was 6 percent of the dairy stock, and in Manica 3 percent. Approximately 162 MERCADO-supported dairy farmers, 102 in Sofala and 60 in Manica, lost one or more cows or lost dairy infrastructure, equipment, feed supplies, residences, or other properties.<sup>32</sup>

Project estimates of the short-run financial impacts to dairy livestock and related assets, including processed product in stock, are around \$250,000.<sup>33</sup> The project expects increased mortality, decreased fertility, reduced milk yield due to stress and disease, poor milk quality, reduced milk collection, and reduced market access. Moreover, MERCADO beneficiaries have lost dairy cattle and essential infrastructure for dairy market development, which will likely influence implementation and achievement of MERCADO's project objectives.

As part of the midterm evaluation, IMPAQ assessed the effect of the cyclone on MERCADO's project participants and the dairy value chain in Sofala and Manica. We also examined how the cyclone influenced project results. We describe the impact of the cyclone on MERCADO project beneficiaries in detail in **Section 3** and **Section 4**.

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<sup>32</sup> MERCADO Semi-Annual Performance Report to USDA October 2018 to March 2019.

<sup>33</sup> MERCADO Semi-Annual Performance Report to USDA October 2018 to March 2019.

## SECTION 2. MIDTERM METHODOLOGY

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This section outlines the midterm evaluation's data collection methodology and the sources of and types of data collected. We include the evaluation's Midterm Scope of Work in **ANNEX E**, and IMPAQ's Midterm Inception Report can be found in **ANNEX D**.

### 2.1 Midterm Evaluation Methodology

The IMPAQ team conducted a performance evaluation to frame the evaluation through the lens of Mozambique's dairy market system, considering how MERCADO's interventions contribute to the development of a sustainable private-sector-driven dairy market system. IMPAQ used a formative approach to tie together its inquiries at each level of the value chain into a broad picture of MERCADO's relevance, impact, effectiveness, and efficiency and to examine the sustainability and gender equity of the project's activities.

We organized the midterm evaluation using a mixed-methods approach, comparing progress on key outcomes over time for project participants. The midterm evaluation establishes a strong basis for the final evaluation by providing comprehensive documentation of the Beira corridor's dairy market system and data for comparative analysis. At midterm, we collected quantitative and qualitative data from a broad population of dairy value-chain actors. We used a non-experimental design, administering a longitudinal survey to collect quantitative data from 285 farmers who were beneficiaries of the MERCADO project. We also used a repeated cross-sectional semi-structured survey to collect both quantitative and qualitative data from aggregation and value-addition facilities, processors, and dairy breeders. Further, we used focus group discussions and key informant interviews to collect qualitative information from farmers and other value-chain actors including paravets, lecturers, student interns, government and other stakeholders.

We tested hypotheses, developed at baseline, about the project's relevance, impact, efficiency, effectiveness, and sustainability, as well as gender equality and equity considerations. We also evaluated the project's results framework within the context of the dairy value chain and assessed the extent to which MERCADO achieved the strategic objectives of the results frameworks. The midterm evaluation builds on the baseline results and provides a strong basis for the final evaluation by providing longitudinal data and comprehensive documentation of the Beira corridor's dairy market system, especially after incorporating the effects of Cyclone Idai on project implementation and achievement.

#### 2.1.1 Midterm Objectives and Questions

IMPAQ worked with Venture37 to implement the midterm evaluation of the MERCADO project to measure progress made in achieving the intended outcomes presented in the results framework.

The midterm evaluation has ten objectives, as detailed in the terms of reference:

- Assess the relevance of the project strategy and approach as well as the validity of assumptions made during project design
- Measure progress from baseline, including the effectiveness and efficiency of interventions in achieving established targets
- Assess how women and men have benefited differently from the project
- Document lessons learned, challenges, and unanticipated effects
- Identify enablers and constraints to progress (both internal and external factors) that have supported or limited success of the project
- Assess sustainability efforts to date

- Provide recommendations for necessary corrections to strengthen project performance, efficiency, and sustainability
- Provide recommendations for areas of focus for the final evaluation, including reviewing and strengthening data collection systems and metrics in preparation for the final evaluation
- Assess the effect of Cyclone Idai on MERCADO project participants and the dairy value chain as a whole in both Sofala and Manica provinces
- Provide recommendations on the activities that could be discontinued without greatly affecting the project outcomes to make up for a reduction in monetization proceeds

We present the evaluation questions in **Exhibit 3**. At midterm, we provide values for the project indicators and other contextualizing data points. Based on our research, we make recommendations to refine the project approach before the final evaluation. We present evaluation questions and their data collection methods and data sources in **ANNEX C**.

**Exhibit 3. Evaluation Criteria and Questions**

| <b>Evaluation Criteria</b> | <b>Evaluation Question</b>                                                                                                                                                                                             |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Relevance</b>           | Do the results framework, assumptions, project design, and project activities meet the needs of the participants and local conditions in Mozambique’s Manica and Sofala provinces?                                     |
|                            | How well aligned are MERCADO’s strategy and activities with the development goals, objectives, and strategies of USDA, the U.S. government, and the Mozambican government?                                             |
| <b>Impacts</b>             | What impacts are the project activities having on the project participants, both positive and negative, especially in relation to the expected results and strategic objectives?                                       |
|                            | How has the project-provided training impacted the knowledge and uptake of improved agricultural techniques, farm management practices, and post-harvest handling?                                                     |
|                            | How has the use of improved practices affected agricultural productivity (measured through liters of milk per day, number of days of lactation, and calving interval for dairy and measured through yield for forage)? |
|                            | To what extent has increased access to input suppliers affected the uptake of improved agricultural techniques, farm management practices, post-harvest handling, and use of improved infrastructure for farmers?      |
|                            | How has training in improved safety and quality affected the rate of rejection of milk at the aggregation level?                                                                                                       |
|                            | How have project activities influenced total value and quantity of milk and milk product sales?                                                                                                                        |
|                            | How is value captured distributed across different milk market system actors? What can be done to improve value capture and profitability of the actors?                                                               |
|                            | To what extent has access to finance affected the growth of farmer dairy businesses?                                                                                                                                   |
|                            | To what extent has access to finance affected uptake of improved processing techniques, quality standards, and improved infrastructure for processors?                                                                 |
|                            | To what extent have the advocacy activities affected the policy and regulatory framework to support growth and investment in the dairy sector?                                                                         |
|                            | What internal and external factors have influenced the ability of the project to meet expected results and targets?                                                                                                    |
|                            | How did Cyclone Idai influence the project’s results?                                                                                                                                                                  |
| <b>Effectiveness</b>       | To what extent are the project targets and outcomes likely to be achieved by the end of the project?                                                                                                                   |
|                            | What key successes should be replicated or key improvements should be made to the implementation to maximize the results?                                                                                              |
| <b>Efficiency</b>          | Were the resources and activities provided by the project carried out in a timely manner and with effective use of resources?                                                                                          |

| <b>Evaluation Criteria</b>               | <b>Evaluation Question</b>                                                                                                                                                 |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          | How well has the project been managed and monitoring and evaluation data been used to make programmatic decisions?                                                         |
| <b><i>Sustainability</i></b>             | Which project activities and benefits are likely to be sustained or not sustained past the project lifespan, and why?                                                      |
|                                          | What exit strategy has the project put into place to ensure the sustainability of the project outcomes?                                                                    |
|                                          | What activities could the project scale down or eliminate without affecting project outcomes to make up for reduction in monetization proceeds?                            |
| <b><i>Gender equality and equity</i></b> | How has the project addressed the constraints faced by women in the dairy sector?                                                                                          |
|                                          | What has the project done to ensure participation of both men and women? What could the project have done better?                                                          |
|                                          | How do the outcomes of the project differ between men and women? What could the project have done differently to ensure that equal benefits accrued to both women and men? |

### 2.1.2 Data Sources

IMPAQ started by conducting a document review of all relevant documents from Venture37. This review informed the development of quantitative and qualitative instruments. The documents included semi-annual performance reports submitted to USDA, special studies conducted by Venture37, and other relevant documents.

Then, IMPAQ collected quantitative data through a survey of dairy farmers in July 2019. We complemented these quantitative farmer-level data with qualitative data collected from farmers in focus group discussions. We also conducted a semi-structured survey with other value-chain actors, such as aggregation and value-addition facilities (cooperatives), processors (including microprocessors), and breeders. These semi-structured surveys included both close-ended (quantitative) questions and open-ended (qualitative) questions. In addition, we conducted key informant interviews with stakeholders including project staff, government representatives, paravets, student interns, and lecturers.

The focus group discussions and key informant interviews helped contextualize stakeholder insights on the dairy sector. We tailored all quantitative and qualitative data collection instruments to each stakeholder's type of involvement in the project. We discussed with Venture37 any modifications needed in data collection instruments from baseline to account for changes in project implementation. Based on discussions with Venture37, there were significant deviations from the survey instruments between baseline and midterm for both the farmer survey and the semi-structured surveys.<sup>34</sup>

All data collection instruments and interviews were designed initially in English and subsequently translated to Portuguese. Data collection personnel used the most appropriate language for each respondent by selecting the correct language at the start of the survey using their tablet computers.

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<sup>34</sup> We document these changes in detail in **ANNEX G**, the reasons for making them, and their implications for the interpretation of findings in this midterm report.

### 2.1.3 Sampling and Data Collection

#### **Quantitative Data Collection**

The main data sources for the quantitative data collection were the farmer survey and the semi-structured surveys with aggregation and value-addition facilities and processors.

**Farmer Survey.** We administered the full farmer survey only to farmers who had one or more live dairy cows at the time of the midterm data collection. Farmers who did not have live dairy cows were administered only the survey's geographic and demographic questions.

**Exhibit 4** summarizes the target and actual numbers of respondents for the quantitative data collection from farmers. IMPAQ aimed to collect data from all dairy farmers supported by the Venture37 MERCADO project at midterm. Out of a target sample size of 285 farmers, we completed surveys with 260 farmers, meeting 91 percent of the original target. **Exhibit 5** presents the response rate by province and district. Since the goal of the evaluation was to analyze farmers *with dairy cows*, we focus only on farmers with dairy cows. Out of the 260 completed interviews at midterm, 77 farmers either did not have dairy cows at midterm or never owned cows. Thus, there were only **183 farmers** at midterm *with dairy cows*.

Further, the initial goal of the midterm evaluation was to conduct a balanced panel survey (i.e. surveying the same farmers at baseline and midterm) with farmers who had dairy cows both at baseline and midterm. However, there was not a perfect match between farmers at baseline and farmers at midterm, because some farmers dropped out of the project and new farmers were added as beneficiaries after the baseline evaluation. Out of the 183 farmers at midterm *with dairy cows*, we could match 141 farmers or 49 percent of the baseline evaluation sample. There were 42 farmers, or 15 percent of the midterm sample, who were not part of the baseline evaluation sample and were new farmers. We detail the final sample used for the analysis in **Section 3. Findings from Dairy Farmers**.

**Semi-structured surveys.** We also detail sample sizes for the quantitative data collection for the semi-structured surveys in **Exhibit 4**. For the semi-structured survey of cooperatives, processors, and breeders, once again, a perfect match between baseline and midterm respondents did not exist. Three of the five cooperatives we surveyed at baseline we also surveyed at midterm, so that there is a 60 percent overlap between the baseline and midterm samples. The overlap for the processors is lower, at 38 percent. Five new processors who started processing after the baseline evaluation were included in the midterm sample. Finally, we surveyed the same breeder at baseline and midterm. Therefore, for cooperatives, processors, and breeders, we only provide baseline vs. midterm comparisons for the key performance indicators and do not present baseline vs. midterm comparisons for other outcomes. For cooperatives and breeders, the target and actual sample sizes were the same; we met 100 percent of the target. For processors, we met 89 percent of the original target of nine processors.

**Exhibit 4. Quantitative Data Sources**

| Stakeholder Type                                                  | Data Collection Method                          | Target Sample Size            | Actual Sample Size             |
|-------------------------------------------------------------------|-------------------------------------------------|-------------------------------|--------------------------------|
| <i>Dairy farmers</i>                                              | Panel data survey                               | 285 (Sofala 134; Manica: 151) | 260 (Sofala: 122; Manica: 138) |
| <i>Aggregation &amp; value-addition facilities (Cooperatives)</i> | Semi-structured survey (quantitative component) | 5 (Sofala: 3; Manica: 2)      | 5 (Sofala: 3; Manica: 2)       |
| <i>Processors (including microprocessors)</i>                     | Semi-structured survey (quantitative component) | 9 (Sofala: 7; Manica: 2)      | 8 (Sofala: 6; Manica: 2)       |
| <i>Breeder</i>                                                    | Semi-structured survey (quantitative component) | 1                             | 1                              |

*Note: Actual sample size is defined as the number of completed surveys.*

**Exhibit 5. Farmer Surveys Completed, by Province and District**

| District and Province      | Sample | Completed | Not Completed |
|----------------------------|--------|-----------|---------------|
| Buzi district              | 10     | 0         | 10            |
| Dondo district             | 121    | 120       | 1             |
| Beira district             | 2      | 2         | 0             |
| Total: Sofala Province     | 133    | 122       | 11            |
| Gondola district           | 92     | 79        | 13            |
| Macate district            | 31     | 31        | 0             |
| Sussundenga district       | 9      | 9         | 0             |
| Vanduzi district           | 20     | 19        | 1             |
| Total: Manica Province     | 152    | 138       | 14            |
| Total number               | 285    | 260       | 25            |
| Total percentage of sample | 100%   | 91.23%    | 8.77%         |

### **Qualitative Sampling and Data Collection**

We complemented the quantitative data with qualitative data collected from farmers, paravets, processors, cooperatives, and student interns. We worked closely with local Venture37 staff to select farmers to ensure representation from different scales of production and districts. We also collected qualitative data from the largest dairy farm in Mozambique, which is also involved in processing and breeding activities. In addition, we interviewed ancillary beneficiaries, such as lecturers from universities where the project has done outreach, as well as other key stakeholders involved in the implementation of the project and development of policy and regulatory frameworks, including project staff, project partners, and government representatives. We purposively selected these project beneficiaries to ensure representation of gender and location. Qualitative data collection occurred concurrently with the administration of the farmer survey, in July 2019. **Exhibit 6.** summarizes respondents for the qualitative data collection.



### Exhibit 6. Qualitative Data Sources

| Stakeholder Type                                       | Data Collection Method                       | Sample Size                                                                              |
|--------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------|
| Aggregation & value-addition facilities (cooperatives) | Semi-structured survey (interview component) | 5 (Sofala: 3; Manica: 2)                                                                 |
| Processors (including microprocessors)                 | Semi-structured survey (interview component) | 8 (Sofala: 6; Manica: 2)                                                                 |
| Breeder                                                | Semi-structured survey (interview component) | 1                                                                                        |
| Dairy farmers                                          | Focus group discussions                      | 5 groups (Sofala: 3 groups; Manica: 2 groups) plus one KII with large producer in Manica |
| Paravets                                               | Key informant interviews                     | 6 (Sofala: 2; Manica: 4)                                                                 |
| Student interns                                        | Key informant interviews                     | 11 (Sofala: 6; Manica: 5)                                                                |
| Lecturers                                              | Key informant interviews                     | 2 (Sofala: 1; Manica: 1)                                                                 |
| Government representatives                             | Key informant interviews                     | 4 (national and provincial levels)                                                       |
| Project staff and partners                             | Key informant interviews                     | 5 (4 project staff, 1 partner staff)                                                     |
| Funder (USDA)                                          | Key informant interviews                     | USDA: 2                                                                                  |

#### 2.1.4 Data Collection Instruments

We designed quantitative and qualitative instruments to answer research questions for each stakeholder type's involvement in the project or dairy sector and to address overarching issues relating to the project and its activities in the sector. Please see **ANNEX F** for a list of all data collection instruments.

##### ***Farmer Survey***

IMPAQ modified the baseline panel farm survey to collect data from all dairy farmers participating in MERCADO at midterm. The structured survey collected data on household socio-demographic characteristics and dairy activities, including production and sales of milk. We also collected data on the effects of Cyclone Idai, engagement with the MERCADO project, production practices, finance and investments, and animal health services. The farm household survey also included questions on intra-household distribution of roles and responsibilities in dairy production, allowing nuanced analysis of gender dynamics over the life of the project.

##### ***Semi-Structured Surveys***

Data collection for aggregation and value-addition facilities (cooperatives), processors (including microprocessors), and breeders used semi-structured surveys that IMPAQ tailored to each type of stakeholder. Each semi-structured survey included a component to collect basic business information; a quantitative component to collect data on procurement and sales, finance and investments, training, milk quality, labor, equipment, and record keeping; and a qualitative component using interviews to obtain information on respondents' perspectives on the dairy value chain and their involvement with the project. The one breeder in our sample was administered a KII at baseline, while at midterm the breeder was administered a semi-structured survey.

### ***Focus Group Discussions***

IMPAQ conducted focus group discussions with a subsample of farmers. We asked about their experiences with the MERCADO project, including farming practices, successes and challenges, milk productivity and sales, and unexpected outcomes. These groups also discussed how participation in MERCADO activities affected intra-household gender dynamics, including participation of women in productive activities, distribution of the benefits of dairy activity in the household, and women's involvement and influence in household decision-making.

### ***Key Informant Interviews***

IMPAQ conducted interviews with community paravets, student interns, university lecturers, and other stakeholders, including government representatives, project partners, and project staff. The interview guides included questions about respondents' background, current role in the dairy value chain, perceptions of critical issues in dairy value chain development, viewpoints on MERCADO's strategy and activities, and other specific issues relevant to each type of respondent. The interviews with paravets asked about the impacts and challenges of providing services to farmers. For student interns, we assessed their understanding of and perspective on the potential for a career in the dairy industry and documented their experiences with their internships and the MERCADO dairy curriculum. For lecturers, we asked about their experience teaching the MERCADO curriculum and integrating the dairy module into their current livestock and veterinary curriculum, how the module compares to what they previously were using, and any suggestions for curriculum improvement.

For project staff and partners, we included questions related to the effectiveness and efficiency of specific activities to examine whether MERCADO could scale down or eliminate ineffective activities with minimal project disruption. The interviews with government representatives explored the relationship between the project and the government, including whether and how the government is helping to strengthen the dairy sector in Mozambique.

## **2.1.5 Data Analysis**

We analyzed qualitative and quantitative data separately and then integrated the findings to provide a comprehensive response to the research questions during the midterm evaluation.

#### **Midterm Focus Group Discussion Themes**

- Impact of Cyclone Idai on daily activities
- Participation in the dairy value chain
- Successes and challenges faced by dairy farmers — financial, infrastructural, and technical
- Plans for future work in dairy or agriculture
- Effect of MERCADO training on post-harvest handling, farm management, agricultural productivity, safety, and quality practices
- Perceived internal and external factors influencing project activities
- Effect of MERCADO project activities on gender constraints faced by women

#### **Midterm Key Informant Interview Themes**

- Impact of Cyclone Idai on the dairy sector
- Current role in the dairy value chain
- Perceptions of critical issues in the dairy value chain
- Perceived internal and external factors influencing project activities
- Effect of MERCADO project activities on gender constraints faced by women
- Likelihood of project targets and outcomes being met by the end of the project
- Sustainability of project activities
- Extent to which activities have efficiently used resources
- Implementation challenges

### **Quantitative Data Analysis**

Based on discussions with Venture37, to analyze quantitative data from farmers, we define three distinct sample types as outlined below:

- **Matched sample.** 141 farmers with dairy cows at baseline still had dairy cows at midterm. Within this number is one very large farm with 250 cows. This farmer was administered only an abridged version of the survey at baseline and is an extreme outlier. We exclude this farm from the main analysis, including it only in calculating the main performance indicators (similar to baseline). Thus, *140 farmers (subtracting the one extremely large farm)* constitute the matched sample for this analysis.
- **New midterm farmers.** 42 farmers with dairy cows joined the project after the baseline evaluation. We present results separately for these farmers in **Section 3** and include them in the calculation of the key performance indicators.
- **Baseline farmers not matched to midterm.** Of the 317 farmers at baseline *with dairy cows*, 112, or 35 percent, were no longer Venture37 beneficiaries at midterm. We do not use these respondents in any analysis that compares baseline to midterm, except for including them in the baseline values of the performance indicators.

For midterm-baseline comparisons, the 140 farmers who were in both the baseline and midterm surveys are the primary sample of interest. The secondary sample of interest is the 42 new farmers who joined the MERCADO project after the baseline evaluation. We refer to the primary sample as the *matched sample* or *matched farmers* and the secondary sample as *new midterm farmers*.

To analyze quantitative data from farmers and other dairy market actors, we used descriptive statistics such as counts, tabulated proportions, and means. We also looked for common trends and patterns in the data. As significant differences presented themselves, we disaggregated and reported the descriptive statistics to reveal differences among project stakeholders based on factors such as gender, scale of operation, and location.<sup>35</sup>

Additionally, we disaggregated the data by subgroups as required by the performance management plan indicators. We also leveraged the availability of longitudinal panel data for dairy market actors and project beneficiaries to enable analysis of project outcomes before and after the intervention for the same actor. Finally, we calculated midterm indicator values of key performance indicators and disaggregated them as required in the performance monitoring plan.

Finally, because we can examine only trends or changes in outcomes without a comparison group, we are unable to attribute the findings *causally* to the MERCADO project. That is, there could be other factors, such as other projects or government programs in the region, which could also contribute to these findings, and we are unable to disentangle the true impact of MERCADO. Thus, the findings in this report represent only correlations between the MERCADO project and the outcomes. That being said, we used qualitative methods, to the extent possible, to provide insights into correlations between various MERCADO practices and desired outcomes such as quality and sales.

### **Qualitative Data Analysis**

Our qualitative data analysis at midterm identifies critical themes and issues. To analyze the interview and focus group data efficiently, impartially, and consistently, we used a structured summary form that

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<sup>35</sup> We do not disaggregate by scale for new midterm farmers, since the sample sizes become very low (i.e. N=42, for new midterm farmers).

identifies key themes and maps them to the evaluation questions outlined in Error! Reference source not found.. We synthesized emerging qualitative results using pattern analysis methods that identify themes in responses. Where relevant, we differentiated results by value-chain stakeholder type, as well as by respondents' gender, scale of operations, and location.

### ***Integrating Qualitative and Quantitative Data***

The evaluation team triangulated the qualitative and quantitative analyses to address the evaluation questions. We compared key findings across both types of data. To overcome any deficiencies in the data, the team analyzed each type of data separately, as described above, and then identified whether and how the two sets of findings coincide in their answers to the evaluation questions. Where discrepancies exist, we considered possible reasons. The team also used qualitative data, whenever possible, to provide contextual information to help interpret the quantitative results. The process of examining the qualitative and quantitative findings in relation to one another figured centrally in the development of comprehensive lessons learned and recommendations. However, as mentioned in **SECTION 7**, one of the limitations of this study is the concurrent collection of quantitative and qualitative data which limits the extent to which the quantitative findings can be contextualized.

We also incorporated a gender-sensitive lens in the midterm evaluation. We identified critical gender concerns to address during evaluation design, data collection, and analysis to ensure that gender is an integral part of the MERCADO midterm evaluation.<sup>36</sup> Through the quantitative farm survey and the focus group discussions, we focused on intra-household distribution of roles and responsibilities at the farm level. We examined how MERCADO project activities affected household-level roles in decision-making about dairy activities, control over milk production, and revenue from sales. We explored the perspectives of women and men about the dairy market and related value chain and the constraints and opportunities faced specifically by women.

## **2.2 Field Implementation**

IMPAQ's data collection team, led by our local partner Center for Development Management, organized and implemented field data collection operations, along with IMPAQ team lead Reinaldo Penner and qualitative specialist Maria DiFuccia. Following approval of the final inception report and data collection instruments by Venture37 on June 28, 2019, IMPAQ transmitted the final approved instruments and protocols to the data collection team for translation into Portuguese, programmed the tablet computers we used for data collection for the farmer survey, and reviewed all instruments.

Mr. Penner and Ms. DiFuccia traveled to Mozambique to participate in and oversee the enumerator training (July 1–4, 2019).

### **2.2.1 Enumerator Training**

We recruited enumerators from local agricultural universities and from the Center for Development Management's pool of enumerators with specific experience in dairy farm data collection. Enumerator training took place over one week in Chimoio and consisted of sessions designed to introduce the enumerator team to the evaluation framework and implementation context. More specifically, the enumerator training included:

- A training on dairy production and marketing concepts reflected in the questionnaires.

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<sup>36</sup> These include: (1) ensuring that evaluation questions asked specifically about gender inclusiveness, if appropriate, (2) disaggregating all data by sex, analyzing for gender differences, and reporting on the findings, and (3) keeping survey and interview work sensitive to women's schedules and availability to participate.

- A section-by-section review of the data collection instruments and in-class practical application using tablets. The enumerators broke into pairs to practice the farmer survey with each other.
- A final session during which enumerators had the opportunity to address any remaining questions before commencing fieldwork.

### **2.2.2 Logistics**

Our local data collection partner used 10 quantitative survey enumerators, two supervisors, one field manager, and one local qualitative expert. The qualitative expert and Mr. Penner together conducted interviews and focus group discussions in Chimoio. The teams conducted data collection over a 16-day period beginning July 5 and ending July 20, 2019. We sent the final field update to Venture37 on July 22, 2019. Each team of five enumerators had a supervisor who provided data quality control; each team also had two vehicles to ensure timely movement. Because approximately 75 percent of project beneficiaries were in Manica province, both teams collected data in Manica during the first five days. For the next five days, one team transferred to Sofala province while the other completed data collection in Manica. Mr. Penner led oversight of field data collection and conducted key informant interviews and focus group discussions with select value-chain respondents. Ms. DiFuccia conducted key informant interviews with stakeholders, including project staff, partners, and government officials; she also provided oversight, in consultation with Mr. Penner, to ensure a consistent technical approach and coordination.

Venture37 staff were instrumental in connecting the IMPAQ team to nearly all of the respondents at midterm. Venture37 extension workers worked with the data collection team to locate and contact the farmers, with the assistance of Venture37 provincial coordinators. The data collection team also utilized the support of the community paravets to make the initial introductions and to set up interview dates and times with respondents.

### **2.2.3 Data Collection Challenges**

We document below the challenges encountered during data collection. These challenges may have affected the number of respondents the team reached or the quality of the data the team collected.

#### ***Lack of Field Testing***

As discussed with Venture37 prior to data collection, because all dairy farmers in the region are beneficiaries either of MERCADO or of a previous Venture37 project, we did not field test the farmer survey prior to data collection. Field testing with non-project beneficiaries allows the evaluation team to validate the surveys, by checking for flow, reliability of translation, the local context, and understanding of the wording of questions. After field testing, the survey is adjusted to correct for any confusion. Not field testing the surveys resulted in responses that were sometimes incomplete or inaccurate. We mitigated this to some extent by using the first day of data collection as a limited field test, after which the team made minor updates to the instruments based on feedback from the enumerators. In addition, enumerators practiced with each other during the enumerator training and held daily debrief meetings with the supervisors to review any confusing questions.

#### ***Survey Fatigue***

Another challenge was survey fatigue. The length of the survey could have potentially contributed to inaccurate responses, especially toward the end of the survey, where we asked important questions on production and sales. Some questions also required respondents to make calculations, which could lead to inconsistency in responses. One example is the questions regarding the utilization of total milk production in liters by type (milk retained for consumption, lost, or sold to cooperatives, local processors, or other buyers). For the majority of the farmers, the sum of their responses for the specific

dispositions of milk did not equate to the total milk production. For all these reasons, we interpret findings on milk production and sales for farmers in **Section 3** with caution.

#### ***Difficulties in Collecting Cost and Revenue Data***

One of the major problems faced by the data collection team was collecting confidential information from businesses related to costs and revenues. Cooperatives and processors were hesitant to provide information regarding the value of their sales and pricing trends of their products. One main reason may be that, in such a small market, cooperatives and processors want to be careful in sharing this information to try to protect themselves from their competitors and hesitate to share confidential information. As we note in **Section 4**, this lack of trust resulted in non-responses to questions regarding volume and value of milk procurement and milk sales. This has implications for the reliability of our cost and revenue findings, since there are a small number of cooperatives and processors to begin with.



### SECTION 3. FINDINGS FROM DAIRY FARMERS

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This section presents the main findings from dairy farmers. The main objectives of the midterm collection of quantitative and qualitative data from dairy farmers were to gather data on herd composition, production practices, animal health services, volume and value of milk production and sales, engagement with MERCADO, and impacts of Cyclone Idai.

By providing midterm values for key dairy production performance indicators, including production volumes and values, sales volume and value, and farmer practices, midterm quantitative and qualitative findings from the survey yield key insights into the questions of relevance, impact, effectiveness, efficiency, and sustainability outlined in **Exhibit 3**. These findings will be instrumental in measuring change across the life of the project. This midterm analysis also provides recommendations and serves as a collaborative learning and adaptation tool for project management.

We structure the remainder of this section as follows: **Section 3.1** presents an overview of the farmer sample, with information on distribution of farms at midterm relative to baseline, demographic characteristics and income sources, herd composition, and record keeping. It also explores dairy farm attrition from baseline to midterm and the attendant causes. **Section 3.2** explores farmer practices on grazing, forage, feed, supplements, housing, and water allocation. It also discusses breeding methods for dairy cattle. **Section 3.3** examines animal health practices, including animal health testing, vaccinations, and ease of access to health services. **Section 3.4** discusses the engagement of dairy farmers with the MERCADO project. **Section 3.5** examines milk production, sales, and quality issues, while **Section 3.6** explores the impact of Cyclone Idai. Finally, **Section 3.7** examines labor use. All values reported are for the 12 months from July 1, 2018, to June 30, 2019; we disaggregated by dry and rainy season wherever possible. Dry season is the period from May through October 2018, and rainy season is the period from November 2018 through April 2019.

There are three important caveats for the analysis of data from the farmer survey:

- 1) **Changes in farm scales.** For most outcomes that include comparisons between baseline and midterm, we report values disaggregated by farm scale for farmers we could match in both rounds (baseline and midterm). Since farm scale is endogenous and is affected by the MERCADO project, for comparisons between baseline and midterm, we define farm scale as the baseline level of farm scale and keep that constant. This implies that, if farmers switched farm scale (e.g., medium farmers at baseline became small farmers at midterm or small farmers at baseline became medium farmers at midterm) we consider their scale at baseline to be their “farm scale” in both rounds. In this way, we are able to capture any changes that the MERCADO project has had on farm scale as well.<sup>37</sup> The discussions of sample distribution in **Sections 3.1.1** and **3.1.2** and of outcomes that we measured only at midterm in **Sections 3.4** and **3.6** define farm scale based on the data collection round we are discussing.
- 2) **Attribution of impacts to MERCADO inputs.** Our survey instrument captured information about dairy cows and other dairy cattle in general. We did not explicitly ask respondents to give information only about cattle given to them by Venture37. Many medium- and large-scale farmers had cows that Venture37 did not give them. Further, as reported by Venture37 project

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<sup>37</sup> The number of farmers who switched scale from one round to the next is small. Four small farmers at baseline became medium at midterm; six medium farmers at baseline became small at baseline; and finally one large farmer at baseline became small at midterm. We define small, medium, and large by the *number of dairy cows*.

staff, it is possible that some dairy farmers were not given cattle through MERCADO, but were still given coaching and training to improve their productivity. Consequently, as noted in **Section 1**, we are unable to causally link changes in key outcomes directly to inputs given by Venture37.<sup>38</sup>

- 3) **Small sample sizes.** For many outcomes, sample sizes are low because of non-response. Further, the matched sample includes only one large-scale farmer. Thus, we must view all findings in this section as exploratory.

### 3.1 Overview of the Sample

#### 3.1.1 Distribution of Farms

We begin by presenting the distribution of farms by their scale of operation during baseline and midterm in **Exhibit 7**. We define farm scale throughout this report by the number of dairy cows:

- *Small-scale farmers:* one to three dairy cows
- *Medium-scale farmers:* four to 19 dairy cows
- *Large-scale farmers:* 20 or more dairy cows

All farmers with dairy cows at baseline and all farmers with dairy cows at midterm are included in **Exhibit 7**. There were 183 farmers at midterm with dairy cows, compared to 317 at baseline. We discuss dairy farm attrition in **Section 3.1.2**. At both baseline and midterm, dairy production in the Beira corridor is primarily a small-scale enterprise: At midterm, around 86 percent of dairy farmers had one to three dairy cows. Although this is a decline from baseline, where 94 percent were small-scale dairy farmers, the overwhelming proportion of farmers at midterm were still small-scale farmers.

The proportion of medium-scale farmers (with four to 19 cows) increased from 6 percent at baseline to 13 percent at midterm.<sup>39</sup> There is no change in the proportion of large-scale farmers with 20 or more cows, who represent about 1 percent of the sample at baseline and midterm.

While throughout the midterm report we use the definition of farm scale as defined above, in **Exhibit 8**, we present the distribution of farms using an alternate definition of farm scale at the request of Venture37. In this alternate definition, we define small, medium, and large farmers using the ‘productive potential’ of a farmers’ herd. Thus, we include dairy cows *and* adult heifers in categorizing farmers. For instance, small farmers are defined as those who own between one to three cows and heifers combined. We find that using this alternate definition, the proportion of small farmers has declined from 91 percent at baseline to 76.5 percent at midterm, and the proportion of medium-scale farmers has increased from 8 percent at baseline to 20 percent at midterm. However, we interpret the findings in this table with caution. This is because, in the survey instrument we asked farmers about cow and heifer ownership separately. Since in Portuguese cows are understood as including both cows and heifers, farmers could have reported adult heifers twice – once when they reported their total number of cows, and once when they reported their total number of heifers. Thus, the findings in this table has measurement error because of this double counting.

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<sup>38</sup> For instance, there were many medium -scale and large- scale farmers who had cows that were not given to them by Venture37. Thus, we cannot attribute outcomes for these farmers to cows distributed by Venture37.

<sup>39</sup> According to interviews with Venture37 project staff, many small farmers are still being supported through the DHF and their applications for cattle will be processed in the coming months. This will enable more small farmers to transition into medium-scale producers.

### Exhibit 7. Baseline and Midterm Distribution of Farms by Scale

| Scale of Farm               | Baseline Number of Farms <sup>1</sup> | Baseline % of Farms | Midterm Number of Farms <sup>2</sup> | Midterm % of Farms |
|-----------------------------|---------------------------------------|---------------------|--------------------------------------|--------------------|
| Small (1–3 cows)            | 297                                   | 93.69%              | 158                                  | 86.34%             |
| Medium (4–19 cows)          | 18                                    | 5.68%               | 23                                   | 12.57%             |
| Large (20+ cows)            | 2                                     | 0.63%               | 2                                    | 1.09%              |
| All farmers with dairy cows | 317                                   | 100%                | 183                                  | 100%               |

Note: Sample includes all farmers who identified at the time of the survey that they currently owned dairy cows.

<sup>1</sup> Farm scale as defined at baseline

<sup>2</sup> Farm scale as defined at midterm

### Exhibit 8. Baseline and Midterm Distribution of Farms by Alternate Definition of Farm Scale

| Scale of Farm <sup>3</sup>           | Baseline Number of Farms <sup>1</sup> | Baseline % of Farms | Midterm Number of Farms <sup>2</sup> | Midterm % of Farms |
|--------------------------------------|---------------------------------------|---------------------|--------------------------------------|--------------------|
| Small (1–3 cows and adult heifers)   | 290                                   | 91.48%              | 140                                  | 76.50%             |
| Medium (4–19 cows and adult heifers) | 24                                    | 7.57%               | 37                                   | 20.22%             |
| Large (20+ cows and adult heifers)   | 3                                     | 0.95%               | 6                                    | 3.28%              |
| All farmers with dairy cows          | 317                                   | 100%                | 183                                  | 100%               |

Note: Sample includes all farmers who identified at the time of the survey that they currently owned dairy cows.

<sup>1</sup> Farm scale as defined at baseline

<sup>2</sup> Farm scale as defined at midterm

<sup>3</sup> The definition of farm scale suffers from measurement error because of double counting of heifers

**Exhibit 9** presents the sample distribution by farm type: household, organization, or firm. The differentiation among these types has important implications, as it affects the professionalization and economics of production. We include only farmers that completed surveys in this exhibit ( $N = 260$ ). Nearly all small-scale farms (95 percent) were households; the large-scale farms often operated as organizations with dairy operations or as commercial firms. There were no household production units among the large-scale farms in the sample. Around 65 percent of medium-scale farmers were households, with 22 percent being run as organizations and 13 percent being run as commercial firms.

### Exhibit 9. Midterm Distribution of Farms by Type

| Farm Type    | No Longer Farming | Never Owned Cows | Small  | Medium | Large  | Total  |
|--------------|-------------------|------------------|--------|--------|--------|--------|
| Household    | 96.00%            | 100%             | 94.94% | 65.22% | 0%     | 91.92% |
| Organization | 4.00%             | 0%               | 2.53%  | 21.74% | 50.00% | 5.00%  |
| Firm         | 0%                | 0%               | 2.53%  | 13.04% | 50.00% | 3.08%  |
| Total        | 100%              | 100%             | 100%   | 100%   | 100%   | 100%   |
| N            | 75                | 2                | 158    | 23     | 2      | 260    |

Note: The sample size for columns 1 and 2 includes farmers at midterm who did not have dairy cows. For columns 3–5, the sample includes farmers who had dairy cows at midterm regardless of whether we matched them to baseline farmers. We define farm scale as the midterm level.

### 3.1.2 Farm Attrition

This section discusses two types of attrition in dairy farms between baseline and midterm:

- **Reduction in MERCADO project beneficiaries.** The total number of beneficiaries of the MERCADO project at baseline was 524.<sup>40</sup> The total number of project beneficiaries at midterm was 285. Also, of note, not all of these 285 beneficiaries at midterm were established farmers from baseline. That is, some were new farmers who joined the project after the baseline evaluation was completed. As explained by project staff during qualitative interviews, this reduction in the number of beneficiaries is in line with a major goal of MERCADO – to focus project activities on a fewer number of farmers who show a greater interest and capacity to eventually grow into medium- or large-scale farmers, thus ensuring a greater chance of sustainability after Venture37 no longer provides support.
- **Loss of dairy cows.** Dairy farmers faced a multitude of challenges in the last year, including the devastating effects of Cyclone Idai. **Exhibit 10** compares the proportions of farmers who no longer had dairy cows at baseline and at midterm. At baseline, 127 farmers, or 29 percent of the sample, did not have dairy cows. At midterm, 75 farmers, or 29 percent, did not have dairy cows. Of the 75 farmers who did not have cows at midterm, 53 (71 percent) were MERCADO project beneficiaries at baseline.<sup>41</sup> Using Venture37 monitoring data, **Exhibit 11** presents reasons for dairy farm attrition from baseline to midterm.<sup>42</sup> The reasons for dairy farm attrition fell into five categories: (1) cows died, (2) cows were sold off or transferred, (3) cows were slaughtered, (4) other reasons such as the farmer no longer had dairy cows but did have other dairy cattle such as heifers, bulls, and calves, and (5) reasons were not identified. About 22 percent of dairy cows were lost due to deaths. Farmers sold off another 23 percent. Finally, 41 percent still had some production potential in the form of dairy heifers, bulls, and calves; while for 11 percent, no reason was given in the Venture37 monitoring data. Since farmers could lose dairy cows for more than one reason, the percentages do not necessarily add to 100 percent.

**Exhibit 10. Farms That No Longer Had Dairy Cows**

| Dairy Cow Status           | Baseline Number of Farms | Baseline % of Total Farms | Midterm Number of Farms | Midterm % of Total Farms |
|----------------------------|--------------------------|---------------------------|-------------------------|--------------------------|
| No longer have dairy cows  | 127                      | 28.60%                    | 75                      | 28.85%                   |
| Never owned dairy cows     | -                        | -                         | 2                       | 0.77%                    |
| Currently owned dairy cows | 317                      | 71.40%                    | 183                     | 70.39%                   |
| Totals                     | 444                      | 100%                      | 260                     | 100%                     |

*Note: Totals represent the number of completed surveys at baseline and midterm.*

<sup>40</sup> Exhibit 4, MERCADO Baseline Evaluation Report. IMPAQ International. 2017.

<sup>41</sup> More specifically, of these 53 farmers, 50 were small-scale farmers at baseline, two were medium-scale farmers, and one was a large-scale farmer.

<sup>42</sup> IMPAQ has relied on Land O'Lakes monitoring data for this exhibit and has not verified these findings.

### Exhibit 11. Reasons for Loss of Dairy Cows

| Reason for Loss of Cows               | Percent of Cows Lost |
|---------------------------------------|----------------------|
| Died                                  | 22%                  |
| Sold off or transferred               | 23%                  |
| Slaughtered                           | 3%                   |
| Still have heifers, bulls, and calves | 41%                  |
| Not identified/Other                  | 11%                  |

Source: Venture37 Monitoring Data, 2019. Farmers could lose dairy cows for more than one reason, so the percentages add up to more than 100%.

### 3.1.3 Matching Baseline and Midterm Respondents

Exhibit 12 presents the extent of matching between baseline and midterm respondents who had at least one dairy cow. Between baseline and midterm, there were three types of farmers:

- **Matched sample.** As outlined in Exhibit 12, there were a total of 141 farmers with dairy cows at baseline who still had dairy cows at midterm. Within this number is one very large farm with 250 cows. This farmer was administered only an abridged version of the survey at baseline and is an extreme outlier. We exclude this farm from the main analysis, including it only in calculating the main performance indicators in ANNEX A. Thus, 140 farmers (subtracting the one extremely large farm) constitute the matched sample for this analysis.
- **New midterm farmers.** 42 farmers with dairy cows joined the project after the baseline evaluation.
- **Baseline farmers not matched to midterm.** Of the 317 farmers at baseline with dairy cows, 112, or 35 percent, were no longer Venture37 beneficiaries at midterm. The most common reason for these baseline farmers no longer being associated with Venture37 was that they were no longer dairy farmers.<sup>43</sup>

The 140 farmers who were in both the baseline and midterm surveys are the primary sample of interest. The secondary sample of interest is the 42 new farmers who joined the MERCADO project after the baseline evaluation. We refer to the primary sample as the *matched sample* or *matched farmers* and the secondary sample as *new midterm farmers*.

### Exhibit 12. Matching Farmers Between Baseline and Midterm

| Scale of Farm      | Baseline Farmers with Dairy Cows <sup>1</sup> | Midterm Farmers with Dairy Cows <sup>2</sup> | Farmers with Dairy Cows in Both Rounds | New Midterm Farmers with Dairy Cows | Baseline Farmers Not Matched at Midterm |
|--------------------|-----------------------------------------------|----------------------------------------------|----------------------------------------|-------------------------------------|-----------------------------------------|
| Small              | 297                                           | 157                                          | 125                                    | 32                                  | 111                                     |
| Medium             | 18                                            | 24                                           | 14                                     | 10                                  | 1                                       |
| Large <sup>3</sup> | 2                                             | 1                                            | 1                                      | 0                                   | 0                                       |
| Total              | 317                                           | 182                                          | 140                                    | 42                                  | 112                                     |

<sup>1</sup> Farm scale as defined at baseline

<sup>2</sup> Farm scale as defined at midterm

<sup>3</sup> Excludes a very large farm with more than 250 cows at midterm

<sup>43</sup> Source: Venture37 monitoring data.

### 3.1.4 Demographic Characteristics

**Exhibit 13** reports important demographic characteristics of the sample including gender, age, education, and food security. The sample is restricted to farmers who owned cows and who reported household details. We excluded farmers who did not respond to these questions.

We present information on demographic characteristics and income sources for the entire midterm sample of both matched farmers and new midterm farmers. For the matched sample, we report only baseline values for gender and education because of inconsistencies in reporting for key demographic characteristics, with gender and education being different between baseline and midterm for matched farmers. One potential reason for this inconsistency is that sometimes the main owner of the farm changed from baseline to midterm. Thus, we present baseline statistics for the matched sample for gender and education background, since these characteristics should remain constant between baseline and midterm. For food security, we report midterm values for both the matched sample and the new midterm farmers.

Around 72 percent of the matched sample was male, with an average age of 54 years at midterm. With respect to educational background, the proportion of matched farmers who had completed primary education (grade 1-5) was 22 percent. A significant percentage, about 9 percent, had no schooling. Few matched farmers had completed higher levels of schooling: Only 9 percent finished secondary school and only 3.5 percent finished university or postgraduate studies. Finally, with respect to food security, 36 percent of matched farmers at midterm reported that there were times in the last year when they did not have enough to eat. One reason for this high proportion could be food shortages resulting from Cyclone Idai.

**Exhibit 13. Farmer Demographic Characteristics**

| Variable                                             | Matched Sample | New Midterm Sample |
|------------------------------------------------------|----------------|--------------------|
| Male                                                 | 72.09%         | 57.14%             |
| Average age (in years)                               | 54.19 years    | 52.67 years        |
| <b>Educational Background</b>                        |                |                    |
| Primary of first degree (1st–5th class)              | 22.09          | 21.05              |
| Primary of second degree (6th–7th class)             | 24.42          | 21.05              |
| Secondary of first degree (8th–10th class)           | 16.28          | 16.32              |
| Secondary of second degree (11th–12th class)         | 9.30           | 5.26               |
| Technical-professional                               | 2.33           | 10.53              |
| University/postgraduate studies                      | 3.49           | 0.00               |
| Did not complete any degree but went to school       | 12.79          | 5.26               |
| No schooling                                         | 9.30           | 10.53              |
| <b>Food Security</b>                                 |                |                    |
| Times when family did not have enough to eat (% yes) | 36.00%         | 42.11%             |
| Meals per day                                        | 2.68 meals     | 2.70 meals         |
| Overall N                                            | 78             | 21                 |

*Note: The sample is limited to all farmers who identified at the time of the survey that they currently owned dairy cows at midterm and were self-reporting, with disaggregation for whether we matched them to baseline. Matched sample farmers values report baseline values for gender and education background (N=86 for baseline self-reported demographic characteristics).*



### 3.1.5 Main Income Sources

This section reports the main income sources for the two samples of interest: matched farmers and new midterm farmers.

**Exhibit 14** reports income sources of dairy farmers, disaggregated by farm scale for the matched sample. The last column shows income sources for the new midterm farmers. We do not disaggregate by scale for new midterm farmers and only present overall numbers, since the sample sizes become very low. We mark significant differences between baseline and midterm by asterisks. For the matched sample, farm scale is defined as the baseline level. For the matched sample, we see a significant decline (at the 1 percent level) in the proportion of small farmers for whom dairy farming is the primary source of income.

At midterm, dairy farming is still the most common source of income for small- and medium-scale farmers, with crop production as the second most popular income source (the one large-scale farmer who we matched from baseline and midterm did not respond to any of the income questions at midterm). However, there are significant changes in the proportion of farmers viewing dairy farming as their main income source. At baseline, 87 percent of small farmers reported dairy farming as their primary source of income; at midterm, only 74 percent of small farmers reported that. There was a decline in small farmers whose primary source of income was crop production, while there was an increase in the share whose primary source of income was livestock agriculture. The proportion of medium-scale farmers for whom dairy farming was the primary source of income (86 percent at midterm versus 100 percent at baseline), declined. The proportion of medium-scale farmers for whom daily labor was the primary source of income increased significantly. Unlike small-scale farmers, more medium-scale farmers reported trade or shop keeping as their primary source of income (15 percent at baseline compared to 57 percent at midterm). There was an overall increase in the percentage of farmers reporting daily labor as their primary source of income for both small and medium farmers and the difference is significant at the 5 percent level (from 18 percent at baseline to 30 percent at midterm for small farmers and from no medium farmer at baseline to 29 percent at midterm).

Finally, 75 percent of new midterm farmers reported that dairy farming was their primary source of income. The second most important source of income for these farmers was crop production, at 72 percent. For around one-third of the new midterm farmers other livestock was the primary source of income while for another one-third the primary source of income was daily labor.

**Exhibit 14. Income Sources by Farm Scale**

| Primary Income Source | Small    |           | Medium   |          | Large    |         | New Midterm Farmers |
|-----------------------|----------|-----------|----------|----------|----------|---------|---------------------|
|                       | Baseline | Midterm   | Baseline | Midterm  | Baseline | Midterm |                     |
| Dairy farming         | 87.20%   | 73.87%*** | 100%     | 85.71%   | 100%     | N/A     | 75.00%              |
| Other livestock       | 16.80%   | 27.03%*   | 53.85%   | 57.14%   | 100%     | N/A     | 33.33%              |
| Crop production       | 88.80%   | 65.77%*** | 69.23%   | 71.43%   | 0%       | N/A     | 72.22%              |
| Fisheries             | 1.60%    | 4.5%      | 7.69%    | 0%       | 0%       | N/A     | 5.56%               |
| Government            | 16.00%   | 21.62%    | 23.08%   | 28.57%   | 0%       | N/A     | 13.89%              |
| Private sector        | 12.00%   | 17.12%    | 23.08%   | 14.29%   | 100%     | N/A     | 22.22%              |
| Daily labor           | 17.60%   | 29.73%**  | 0%       | 28.57%** | 0%       | N/A     | 30.56%              |
| Trade/shopkeeper      | 28.00%   | 18.92%    | 15.38%   | 57.14%*  | 100%     | N/A     | 25.00%              |
| Social support        | 8.00%    | 14.41%    | 15.38%   | 0%       | 100%     | N/A     | 16.67%              |
| Forest products       | 8.00%    | 9.01%     | 7.69%    | 0%       | 0%       | N/A     | 2.78%               |
| Other                 | 8.80%    | 12.61%    | 7.69%    | 0%       | 0%       | N/A     | 19.44%              |
| N                     | 125      | 111       | 13       | 7        | 1        | 0       | 36                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. We allowed multiple responses, so responses can add up to more than 100%. The sample sizes differ between baseline and midterm because of different rates of non-response. Since farm scale is endogenous and the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant.*

### 3.1.6 Herd Composition

We report the herd composition of the matched sample disaggregated by farm scale and of new midterm farmers in **Exhibit 15**. For the matched sample, the average herd size of small farmers at midterm was 3.42 cattle, compared to 2.13 cattle at baseline — including, on average, one dairy cow. The herd size of small farmers increased significantly (at the 1 percent level) from baseline to midterm. The average medium-scale herd had 16.93 cattle, including 8.07 dairy cows, 3.64 heifers, 1.86 female calves, and 1.36 bulls. The percentage of heifers, and female calves owned by all farmer types is relatively small. For instance, for medium-scale farmers, heifers and calves, which represent future production potential, make up only a third of a herd (5.5 heifers and calves out of 16.93 cows). Medium-scale farmers did not see any significant changes to their herd composition from baseline to midterm. For the one large farmer who we matched from baseline to midterm, herd size declined from 46 cattle at baseline to 36 at midterm. For new midterm farmers, the average herd size was 5.98 dairy cattle, including 2.48 dairy cows.

Focus group discussions revealed that, although the average herd size for small-scale farmers increased from baseline, the overwhelming majority of farmers still averaged less than two dairy cows and were therefore susceptible to shocks, including disease, natural disasters, and market fluctuations. Project beneficiaries at all levels said that having three or fewer cows does not allow farmers to make a living from dairy. “With one, two, or three cows for each farmer, it is still unsustainable,” one medium-scale farmer said.

In qualitative interviews, project staff agree that the farms need to be larger in order to be sustainable, and the project is focusing resources and support to increase farm sizes for motivated farmers. While small, the significant increase in herd size for small-scale farmers is a trend the project plans to continue.

**For the project to be sustainable and produce good results, at least four or five cows must be allocated to each beneficiary.**

*-Cooperative chair member and farmer*

For instance, according to project staff, many small farmers are still being supported through the DHF and their applications for cattle will be processed in the coming months. This will potentially enable some small farmers to transition into medium-scale producers. Further, as noted in **Section 7.4**, making Gate 2 of the DIF more accessible is a crucial step in enabling more small farmers to transition to medium-scale farmers.

External factors outside of project control have led to delays in increasing herd sizes – specifically Cyclone Idai and an outbreak of foot-and-mouth disease in South Africa, which prevented the import of cattle to Mozambique. Now that cattle can enter the country in addition to improved local access, project staff expect imported cows awarded through the DHF to increase the size of the herds during the second half of the project.

**Exhibit 15. Herd Composition by Farm Scale**

| Cattle Type              | Small    |         | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|--------------------------|----------|---------|----------|---------|--------------------|---------|---------------------|
|                          | Baseline | Midterm | Baseline | Midterm | Baseline           | Midterm |                     |
| Bulls                    | 0.20     | 0.38    | 3.50     | 1.36    | 2                  | 2       | 0.45                |
| Cows                     | 1.11     | 1.47*** | 7.93     | 8.07    | 26                 | 16      | 2.48                |
| Heifers                  | 0.30     | 0.74*** | 3.14     | 3.64    | 14                 | 5       | 1.00                |
| Female calves            | 0.52     | 0.39    | 4.07     | 1.86    | 4                  | 7       | 1.31                |
| Male calves <sup>2</sup> | N/A      | 0.43    | N/A      | 2.00    | N/A                | 6       | 0.74                |
| Total cattle             | 2.13     | 3.42*** | 18.64    | 16.93   | 46                 | 36      | 5.98                |
| N                        | 125      | 125     | 14       | 14      | 1                  | 1       | 42                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous and the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant.*

<sup>1</sup> Since there is only one larger farmer from baseline who matched to midterm, a comparison is not meaningful.

<sup>2</sup> Respondents were asked about number of male calves only at midterm.

### 3.1.7 Record Keeping

We explore the extent of record keeping by farmers in **Exhibit 16**. The sample includes all farmers at midterm who had dairy cows, regardless of whether we matched them to baseline; we asked about record keeping only at midterm. Almost all farmers kept at least one type of record of dairy activity. Production records were the most common type of record kept by farmers of all sizes. More than 85 percent of medium- and large-scale farmers also kept records for feeding, sales, calving, health of cows, and mortality. On average, smaller proportions of small farmers kept these records. Only 45 percent of small farmers kept feeding records; less than two-thirds (64 percent) kept sales and calving records. According to some project staff and partners, this is an area where the farmers can improve. Project implementers and the larger farmers explained that constant monitoring and tracking of the animals, particularly the connection between feeding, health, and production, is critical for success. “The farmers with the best management skills have the best production,” one staff said.<sup>44</sup>

<sup>44</sup> This was also borne out somewhat by the quantitative data. Among those farmers who kept record, farmers who kept all three types of records (namely health, feeding, and production record) had marginally higher overall daily milk production in the rainy season (about 15 liters per day) compared to those who kept only health records (13 liters per day) or those who kept only feeding records (13 liters per day). Among those who kept no records, overall daily milk production in the rainy and dry seasons was 14 liters and 9 liters, respectively, compared to the average of 15 liters and 11 liters, respectively for those who kept health, feeding, and production records.

### Exhibit 16. Farmer Record Keeping

| Records                                            | Small  | Medium | Large | Total  |
|----------------------------------------------------|--------|--------|-------|--------|
| Kept at least one type of record of dairy activity | 93.63% | 100%   | 100%  | 95.05% |
| <b>If Yes, Types of Record Kept</b>                |        |        |       |        |
| Production                                         | 84.08% | 95.83% | 100%  | 85.71% |
| Feeding                                            | 45.22% | 87.50% | 100%  | 51.09% |
| Sales                                              | 63.69% | 87.50% | 100%  | 67.03% |
| Calving                                            | 63.06% | 91.67% | 100%  | 67.03% |
| Health                                             | 52.87% | 87.50% | 100%  | 57.69% |
| Mortality                                          | 48.41% | 87.50% | 100%  | 53.85% |
| Daily milk production                              | 67.52% | 87.50% | 100%  | 70.33% |
| Allocation of milk to different sources            | 49.68% | 66.67% | 0%    | 51.65% |
| Farm transactions                                  | 31.21% | 54.17% | 0%    | 34.07% |
| Registration of farm visits                        | 41.40% | 45.83% | 0%    | 42.30% |
| N                                                  | 157    | 24     | 1     | 182    |

*Note: The sample is limited to farmers at midterm who identified at the time of the survey that they currently owned dairy cows. Sample includes all midterm farmers regardless of whether we matched them to baseline. We allowed multiple responses, so that responses add up to more than 100%. We define farm scale as the midterm level.*

## 3.2 Production Practices

### 3.2.1 Grazing Systems

**Exhibit 17** shows the types of grazing systems practiced by farmers in the matched sample and examines changes from baseline to midterm. Most farmers at baseline had a no-graze system (98 percent of small-scale and 79 percent of medium-scale farmers). At midterm, the proportion of small farmers who followed a zero-grazing policy decreased significantly (at the 1 percent level) to 82 percent. Similarly, the proportion of medium-scale farmers at midterm who followed zero-grazing decreased to 57 percent. Previously, Venture37 required that farmers use a no-graze system. Venture37 staff explained that this system works well when land is limited, as it is for many of the small farmers who live closer to the town centers. According to project staff, zero-grazing also gives the farmers more control over their animals and reduces exposure to environmental hazards such as ticks. In areas where there are weather extremes – like dry and rainy seasons – zero-grazing can set a constant year-round system to avoid fluctuations in milk production, which tends to decrease in the dry season when natural grazing becomes very difficult. However, this stipulation was relaxed to give farmers more grazing options after feedback from paravets, cooperatives, processors, and farmers.

Among the farmers who grazed, we mostly found significant increase from baseline to midterm for free grazing. We define free grazing as grazing on common pastures. The proportion of small-scale farmers engaging in free grazing at midterm was almost 9 percent, significantly higher (at the 5 percent level) from the baseline proportion of less than 2 percent. There were no significant changes from baseline to midterm for medium-scale farmers for free grazing. Medium-scale farmers tend to free graze more than large-scale farmers since they might not have enough access to land of their own. With respect to semi-free grazing, defined as grazing for some portion of the time in enclosed paddocks and some portion of time on open pastures, there was a significant increase for small farmers. Almost 5 percent of small farmers at midterm engaged in semi-free grazing, compared to less than 1 percent at baseline. There was also an increase in semi-free grazing among medium-scale farmers; however, this increase is not significant. Finally, significant increases in paddock grazing emerged for small farmers. At midterm, 5

percent of small-scale farmers and 7 percent of medium-scale farmers engaged in paddock grazing compared to none in either category at baseline. The difference is significant at the 5 percent level for small farmers. Thus, while it appears that Venture37' scaling back of zero-grazing has been disseminated to farmers, there is scope for wider dissemination since many farmers continue to practice zero-grazing.

**Exhibit 17. Type of Grazing System for Matched Sample**

| Grazing System                     | Small    |           | Medium   |         | Large <sup>1</sup> |         |
|------------------------------------|----------|-----------|----------|---------|--------------------|---------|
|                                    | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |
| No grazing                         | 97.58%   | 81.60%*** | 78.57%   | 57.14%  | 0%                 | 0%      |
| <b>If Grazed, Types of Grazing</b> |          |           |          |         |                    |         |
| Free grazing                       | 1.61%    | 8.80%**   | 21.43%   | 28.57%  | 100%               | 0%      |
| Semi-free grazing                  | 0.81%    | 4.80%*    | 0%       | 7.14%   | 0%                 | 0%      |
| Paddock grazing                    | 0%       | 4.80%**   | 0%       | 7.14%   | 0%                 | 100%    |
| N                                  | 124      | 125       | 14       | 14      | 1                  | 1       |

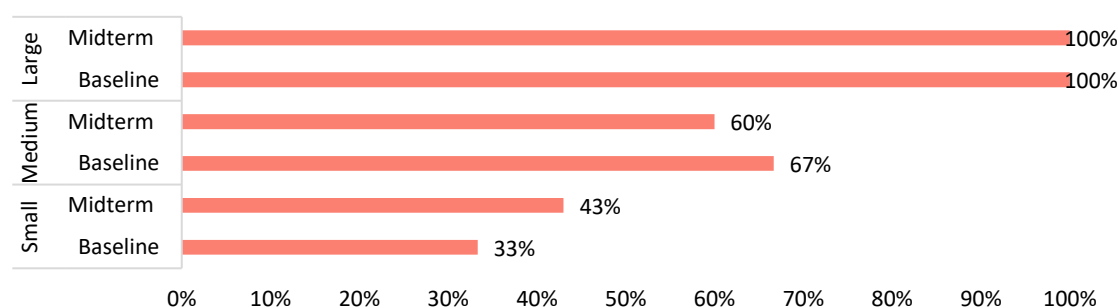
\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who we matched from baseline to midterm and identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous and the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> Since there is only one larger farmer from baseline who matched to midterm, a comparison is not meaningful.

In **Exhibit 18**, we report changes from baseline to midterm in the proportions of matched farmers who reported that access to grazing was easy or somewhat easy. There were no significant differences. For small-scale farmers, there was no significant increase in the proportion of farmers reporting access to grazing as being easy or somewhat easy from 33 percent at baseline to 43 percent at midterm. For medium-scale farmers, the proportion reporting that access to grazing was easy or somewhat easy declined from 67 percent at baseline to 60 percent at midterm. For medium-scale farmers, this is a contradictory finding since medium-scale farmers usually have access to more land. Since, there was a high rate of non-response for this question, we must interpret these findings with caution.

**Exhibit 18. Ease of Access to Grazing for Matched Sample**



\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who we matched from baseline to midterm and identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous and the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses. Since there is only one larger farmer from baseline who matched to midterm, a comparison is not meaningful.*

*N = Small (3 at baseline and 23 at midterm); Medium (3 at baseline and 5 at midterm); Large (1 at baseline and 1 at midterm)*

**Exhibit 19** reports the type of grazing systems and ease of access to grazing for the new midterm farmers. A high proportion of small-scale new midterm farmers practiced zero-grazing (74 percent). The most common type of grazing for new midterm farmers who did graze their cattle was free grazing (12 percent). For new midterm farmers, of those who grazed, only 5 percent practiced paddock grazing. In general, a higher proportion of new midterm farmers than of matched farmers reported that it was easy or somewhat easy to access grazing.

**Exhibit 19. Type of Grazing System and Ease of Access to Grazing for New Midterm Farmers**

| Variable                            | New Midterm Farmers |
|-------------------------------------|---------------------|
| No grazing                          | 73.81%              |
| N                                   | 42                  |
| <b>If Grazing, Types of Grazing</b> |                     |
| Free grazing                        | 11.90%              |
| Semi-free grazing                   | 9.52%               |
| Paddock grazing                     | 4.76%               |
| N                                   | 42                  |
| <b>Ease of Access</b>               |                     |
| Easy or somewhat easy               | 81.82%              |
| N                                   | 11                  |

*Note: The sample is limited to new midterm farmers who identified at the time of the survey that they currently owned dairy cows.*

### 3.2.2 Use, Sources, and Ease of Access to Fodder

**Exhibit 20** reports on matched farmers' use of fodder. The proportion of small-scale farmers giving fodder to their cattle declined significantly (at the 1 percent level) from 94 percent at baseline to 80 percent at midterm. At midterm, 86 percent of medium-scale farmers gave their cattle fodder compared to about 93 percent at baseline, but the change was not significant. The one matched large farmer in our sample did not give cattle fodder at midterm. With respect to the types of fodder given, there were no significant changes for farmers of all scales from baseline to midterm. More than 90 percent of small- and medium-scale farmers gave their cattle fresh fodder at midterm but had done so at baseline as well. The proportion of farmers who gave their cattle hay from baseline to midterm declined. At baseline, 63 percent of small-scale and 73 percent of medium-scale farmers gave their cattle hay. At midterm, the proportions fell to 53 percent of small-scale and 63 percent of medium-scale farmers. Finally, the use of silage increased for medium-scale farmers from 9 percent at baseline to 37 percent at midterm, though this finding is not statistically significant.

Due to the intricate link between grazing and fodder use, we examine fodder use for different types of grazing systems. Interestingly, there was a decline in fodder use among farmer's practicing all grazing types and farmers of all scale. For instance, for small farmers practicing zero-grazing, fodder use fell from 95 percent at baseline to 80 percent at midterm. Similarly, for those practicing free grazing, fodder use fell from 100 percent at baseline to 82 percent at midterm. For medium-scale farmers too, for those practicing zero-grazing, fodder use fell from 91 percent at baseline to 87 percent at midterm.

**Exhibit 21** examines the sources of fodder for the matched sample. A larger proportion of small-scale farmers cultivated their own fodder in the past 12 months (27 percent at baseline versus 47 percent at midterm; significant at the 5 percent level). The proportion of medium-scale farmers who cultivated their own fodder in the past 12 months fell slightly but is not statistically significant. Farmers who cultivated their own fodder in the past 12 months devoted modest amounts of land to fodder cultivation

— around 2.93 hectares of land for small farmers at midterm, not significantly different from the baseline value of 2.31 hectares. We found a significant jump in the proportion of small-scale farmers who had purchased fodder in the past 12 months. At baseline, only 5 percent of small-scale farmers had purchased fodder; this increased to 36 percent at midterm (significant at the 1 percent level). There was also an increase in medium-scale farmers who purchased fodder in the past 12 months, from 13 percent at baseline to 25 percent at midterm. However, this change was not statistically significant.

**Exhibit 20. Use of Fodder for Matched Sample**

| Fodder Use                           | Small    |           | Medium   |         | Large <sup>1</sup> |         |
|--------------------------------------|----------|-----------|----------|---------|--------------------|---------|
|                                      | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |
| Gave fodder to cattle                | 94.40%   | 79.84%*** | 92.86%   | 85.57%  | 100%               | 0%      |
| N                                    | 125      | 125       | 14       | 14      | 1                  | 1       |
| <b>If Yes, Types of Fodder Given</b> |          |           |          |         |                    |         |
| Fresh                                | 97.87%   | 94.68%    | 100%     | 90.90%  | 100%               | N/A     |
| Hay                                  | 62.76%   | 53.19%    | 72.72%   | 63.63%  | 0%                 | N/A     |
| Silage                               | 23.40%   | 29.78%    | 9.09%    | 36.36%  | 0%                 | N/A     |
| N                                    | 94       | 94        | 11       | 11      | 1                  | 0       |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who we matched from baseline to midterm and who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous and the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

**Exhibit 21. Sources of Fodder for Matched Sample**

| Source of Fodder                                    | Small    |           | Medium   |         | Large <sup>1</sup> |         |
|-----------------------------------------------------|----------|-----------|----------|---------|--------------------|---------|
|                                                     | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |
| Own cultivation                                     | 27.97%   | 47.46%**  | 13.38%   | 12.50%  | 0%                 | N/A     |
| N                                                   | 118      | 59        | 13       | 8       | 1                  | 0       |
| Average hectares per farmer for those who cultivate | 2.2 ha   | 2.93 ha   | 50.5 ha  | N/A     | N/A                | N/A     |
| Uncultivated harvest                                | 89.14%   | 83.05%    | 76.92%   | 87.5%   | 100%               | N/A     |
| Purchase                                            | 5.08%    | 35.59%*** | 15.38%   | 25%     | 0%                 | N/A     |
| N                                                   | 118      | 59        | 13       | 8       | 1                  | 0       |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who we matched from baseline to midterm and identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous and the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.



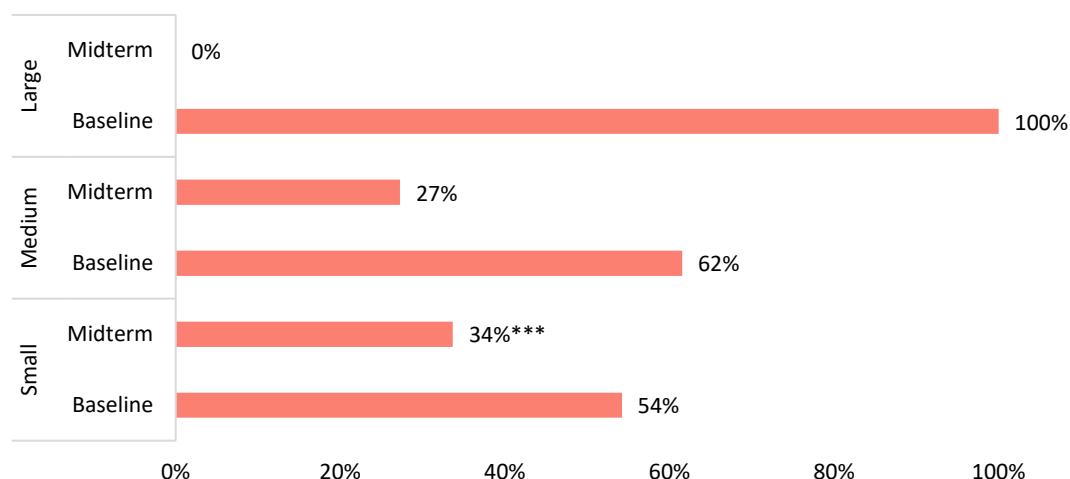
In **Exhibit 22**, we examine ease of access to fodder for the matched sample and examine changes from baseline to midterm, reporting on the proportion of farmers for whom fodder access was easy or somewhat easy. Ease of access for small-scale farmers declined significantly (at the 1 percent level) from baseline to midterm. At baseline, 54 percent of small-scale farmers found access to fodder easy or somewhat easy, compared to only 34 percent at midterm. There was also a large decline for medium-scale farmers, from 62 percent at baseline to only 27 percent at midterm.

During the qualitative interviews with farmers, we heard that many struggled to come up with the resources necessary to supply appropriate feed. “The cost to feed cattle is high. I think we have to learn how to produce forage and mix with other products to save money. Otherwise it will not be sustainable,” one farmer said. Some project implementers agreed. “Successful dairy farmers have to know how to make their own feed,” one staff said. In recognition of the fact that the high cost of feed is an important barrier, according to the semi-annual performance reports of MERCADO, in Year 3 of the project, a large proportion of farmers were trained in fodder production technologies by Tillers International. Further, technology expos were held to expose farmers to appropriate pasture and fodder technologies.

**Animal nutrition needs more support.... We need the ability to produce improved, balanced, and inexpensive feed for farmers who do not have the financial ability to purchase improved feed.**

-Farmer

**Exhibit 22. Ease of Access to Fodder for Matched Sample**



\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who we matched from baseline to midterm and identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous and the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses. Since there is only one larger farmer from baseline who matched to midterm, a t-test is not meaningful*

*N = Small (118 at baseline, 98 at midterm); Medium (13 at baseline, 11 at midterm); Large (1 at baseline, 0 at midterm)*

As shown in **Exhibit 23**, a large proportion of new midterm farmers reported giving their cattle fodder (86 percent of farmers). A little over half of all new midterm farmers (52 percent) reported cultivating their own fodder, and the average land area for cultivating fodder was 3.6 hectares. A large proportion of new midterm farmers also used uncultivated harvest, with more than 80 percent of farmers using it,

similar to the matched sample. Just over a quarter of new midterm farmers (26 percent) report purchasing fodder.

**Exhibit 23. Use and Sources of Fodder for New Midterm Farmers**

| Variable                                            | New Midterm Farmers |
|-----------------------------------------------------|---------------------|
| Farmers who gave their cattle fodder                | 85.71%              |
| N                                                   | 42                  |
| Own cultivation                                     | 51.85%              |
| Average hectares per farmer for those who cultivate | 3.6 ha              |
| Uncultivated harvest                                | 81.48%              |
| Purchase                                            | 25.93%              |
| N                                                   | 27                  |

*Note: The sample is limited to new midterm farmers who identified at the time of the survey that they currently owned dairy cows. Multiple responses were allowed, so responses add up to more than 100%.*

### 3.2.3 Access to Water

In **Exhibit 24**, we examine water access for both the matched farmers and the new midterm farmers. A significant increase (at the 1 percent level) in the proportion of small-scale farmers with continuous access to water was seen. This went from around 2 percent at baseline to more than 15 percent at midterm. The medium-scale farmers also show an increase. This went from 25 percent with continuous access to water at baseline to 43 percent at midterm. Correspondingly, the proportion of farmers who brought water manually to cattle declined. For small farmers, the proportion declined from 98 percent at baseline to 85 percent at midterm (significant at the 1 percent level). For medium-scale farmers, the proportion declined from 75 percent to 57 percent, but the difference is not statistically significant. For those who had to bring water manually to their cattle, the amount of water brought to cattle varied from 60 liters for small-scale farmers to 6 liters for medium-scale farmers. The number of medium-scale farmers who reported an answer to this question, however, is very small, and thus we must interpret these values with caution. There was no significant change in the amounts from baseline to midterm. Finally, it appears that the increase in continuous water use comes at a price, because the proportion of farmers paying for access to water increased. For small-scale farmers, the proportion increased from 20 percent at baseline to 36 percent at midterm (significant at the 1 percent level). For medium-scale farmers, the increase was significant at the 5 percent level, from no one paying for access at baseline to 29 percent paying at midterm. The one large-scale farmer in our matched sample also paid for access to water at midterm.

For new midterm farmers, water access is similar to the matched sample, with 17 percent having continuous water use and more than 48 percent having to pay for water access. A large proportion brought in water manually (83 percent).

In the qualitative data, farmers recognized that additional water for their dairy cows is an important factor in increasing milk production. As a result, some invested in continuous water sources and increased the amount of water given to their cows. Although most farmers understood the relationship between water and production, many farmers lacked the resources to provide a continuous water supply for their cattle, as their farms are not irrigated.

**Exhibit 24. Type of Water Access for Farmers**

| Type of Water Access      | Small        |              | Medium       |             | Large <sup>1</sup> |         | New Midterm Farmers |
|---------------------------|--------------|--------------|--------------|-------------|--------------------|---------|---------------------|
|                           | Baseline     | Midterm      | Baseline     | Midterm     | Baseline           | Midterm |                     |
| Continuous                | 1.80%        | 15.45%***    | 25.00%       | 42.86%      | 100%               | 100%    | 16.67%              |
| Brought in manually       | 98.20%       | 84.55%***    | 75.00%       | 57.14%      | 0%                 | 0%      | 83.33%              |
| N                         | 111          | 123          | 12           | 14          | 1                  | 1       | 42                  |
| Average liters/animal/day | 53.30 liters | 60.10 liters | 19.96 liters | 6.33 liters | N/A                | N/A     | 54.65 liters        |
| N                         | 109          | 84           | 9            | 5           | 0                  | 0       | 29                  |
| Pay for access to water   | 20.97%       | 36.00%***    | 0%           | 28.57**     | 0%                 | 100%    | 47.62%              |
| N                         | 124          | 125          | 14           | 14          | 1                  | 1       | 42                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous and the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup>Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

### 3.2.4 Use, Sources, and Ease of Access of On-Farm Dairy Equipment

We next turn to examining the use, sources, and ease of access to on-farm dairy equipment, starting with milking machines and stainless steel milk cans. We then turn to other miscellaneous equipment including milk-chilling equipment, milk feeders, and milk filters.

#### **Milking Machines**

**Exhibit 25** shows no significant change in the proportion of farmers using milking machines from baseline to midterm. The proportion of small-scale farmers using milking machines is still negligible — less than 2 percent. The proportion of medium-scale farmers using milking machines was 21 percent at baseline and 14 percent at midterm, but the difference is not significant. Among the new midterm farmers, only about 5 percent reported using milking machines.

At midterm, for most farmers, the most common source for replacement milking machines was Venture37. More than 85 percent of matched small-scale farmers and all medium-scale farmers reported Venture37 as the potential source for replacement of milking machines. From baseline to midterm, there was also an increase in matched farmers looking to cooperatives for replacement milking machines, from none at baseline to 52 percent of small-scale farmers and 15 percent of medium-scale farmers at midterm. Findings on ease of access to milking machines show that small farmers found it easier to access milking machines at midterm compared to baseline. However, the responses were very few, making the findings unreliable.

For new midterm farmers, findings were very similar. Most said they would go to Venture37 for replacement milking machines. About a third (35 percent) also viewed cooperatives as a good source of replacements. Finally, about a third of new midterm farmers found it easy to access milking machines.

**Exhibit 25. Use, Sources, and Ease of Access for Milking Machines**

| Variable                                                                | Small    |         | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|-------------------------------------------------------------------------|----------|---------|----------|---------|--------------------|---------|---------------------|
|                                                                         | Baseline | Midterm | Baseline | Midterm | Baseline           | Midterm |                     |
| Used milking machine                                                    | 0%       | 1.60%   | 21.42%   | 14.29%  | 0%                 | 0%      | 4.76%               |
| N                                                                       | 124      | 125     | 14       | 14      | 1                  | 1       | 42                  |
| <b>Potential Source for Replacement of Milking Machines<sup>3</sup></b> |          |         |          |         |                    |         |                     |
| Venture37                                                               | N/A      | 86.90%  | 33.33%   | 100%*** | N/A                | 100%    | 85.29%              |
| Local commercial supplier                                               | N/A      | 32%     | 0%       | 16.67%  | N/A                | 100%    | 29.41%              |
| Local market                                                            | N/A      | 8.00%   | 0%       | 7.69%   | N/A                | 0%      | 12.12%              |
| Cooperative                                                             | N/A      | 52.44%  | 0%       | 15.38%  | N/A                | 0%      | 35.48%              |
| N                                                                       | 0        | 84      | 3        | 13      | 0                  | 1       | 34                  |
| <b>Ease of Access</b>                                                   |          |         |          |         |                    |         |                     |
| Easy or very easy access to replacements <sup>2</sup>                   | N/A      | 25.74%  | 33.33%   | 15.38%  | N/A                | 100%    | 29.27%              |
| N                                                                       | 0        | 101     | 3        | 13      | 0                  | 1       | 42                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. We exclude "Don't know/refuse to answer" responses. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup>Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

<sup>2</sup>Sample sizes are very small.

<sup>3</sup>When there are no observations, N/A is reported.

### **Stainless Steel Cans**

**Exhibit 26** examines the use, sources of, and ease of access to stainless steel cans. The proportion of matched small farmers using stainless steel cans or buckets increased significantly from baseline to midterm. More than 90 percent of farmers of all types used stainless steel cans for storing milk at baseline; this proportion increased to almost 98 percent at midterm. The most common source of potential replacement for all farmers was Venture37. At baseline about 45 percent of small-scale and 71 percent of medium-scale farmers viewed Venture37 as a potential source for replacement. At midterm, these proportions increased to 82 percent for small-scale farmers (significant at the 1 percent level) and 100 percent for medium-scale farmers (significant at the 5 percent level). There was also an increase in the proportion of small-scale farmers who saw local commercial suppliers as sources for replacement, from 11 percent at baseline to 37 percent at midterm (significant at the 1 percent level). In fact all potential sources for replacement of stainless steel cans increased significantly for small-scale farmers. This could possibly be an outcome of other market players getting into this business following the Venture37 MERCADO project. Finally, in ease of access, there was a significant increase (at the 1 percent level) for small farmers, from 16 percent at baseline to 36 percent at midterm possibly due to the presence of Venture37.

For new midterm farmers, use of stainless-steel cans was similar to usage by the matched sample. More than 92 percent of new midterm farmers used stainless steel cans; for over 80 percent of them, the

main source of replacement was Venture37. Cooperatives and local commercial suppliers were the next most popular replacement sources, cited respectively by 57 percent and 24 percent of farmers.

**Exhibit 26. Use, Sources, and Ease of Access for Stainless Steel Cans**

| Variable                                                                 | Small    |           | Medium   |         | Large <sup>1</sup> |         | New<br>Midterm<br>Farmers |
|--------------------------------------------------------------------------|----------|-----------|----------|---------|--------------------|---------|---------------------------|
|                                                                          | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |                           |
| Used stainless steel buckets and/or cans                                 | 90.32%   | 97.52%**  | 92.85%   | 100%    | 100%               | 100%    | 92.68%                    |
| N                                                                        | 124      | 125       | 14       | 14      | 1                  | 1       | 41                        |
| <b>Potential Source for Replacement for Stainless Steel Buckets/Cans</b> |          |           |          |         |                    |         |                           |
| Venture37                                                                | 44.72%   | 81.63%*** | 70.59%   | 100%**  | 0%                 | 100%    | 81.08%                    |
| Local commercial supplier                                                | 11.38%   | 37.08%*** | 14.29%   | 25.00%  | 0%                 | 100%    | 24.24%                    |
| Local market                                                             | 0.81%    | 4.30%*    | 7.14%    | 100%    | 0%                 | 0%      | 5.71%                     |
| Importer                                                                 | 0%       | 11.49%*** | 0%       | 8.33%   | 0%                 | 100%    | 13.79%                    |
| Cooperative                                                              | 23.58%   | 58.18%*** | 14.29%   | 0%      | 100%               | 0%      | 57.89%                    |
| N                                                                        | 123      | 98        | 14       | 12      | 1                  | 1       | 37                        |
| <b>Ease of Access</b>                                                    |          |           |          |         |                    |         |                           |
| Easy or very easy access to replacements                                 | 15.6%    | 36.44%*** | 50%      | 38.46%  | 100%               | 100%    | 28.21%                    |
| N                                                                        | 109      | 118       | 12       | 13      | 1                  | 1       | 39                        |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned cows. "Don't know/refuse to answer" responses are excluded. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-response.*

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

### **Milk Chilling Equipment, Milk Filters, and Milk Feeders**

At midterm, we asked respondents about milk chilling equipment, milk filters, and milk feeders. We show these results in **Exhibit 27**. Only 19 percent of small farmers used milk-chilling equipment, which is unsurprising given their small operations. By contrast, more than 58 percent of medium-scale farmers at midterm used milk-chilling equipment. Both large farmers also used milk-chilling equipment. The most common source for replacement of milk chilling equipment was Venture37, cited by 56 percent of small-scale and 76 percent of medium-scale farmers. The local market was also a potential source of replacement for medium-scale farmers (33 percent), as were local commercial suppliers (33 percent), and imported sources (30 percent). With respect to milk filters, we found that a high proportion of farmers were using milk filters at midterm: 74 percent of small-scale and 88 percent of medium-scale farmers. Once again, Venture37 was the most common source of replacement for milk filters. Cooperatives were the second highest source for replacements, cited by 50 percent of small-scale and 38 percent of medium-scale farmers. About 46 percent of small-scale and 63 percent of medium-scale farmers used milk feeders at midterm.

**Exhibit 27. Use and Sources for Milk Chilling Equipment, Milk Filters, and Milk Feeders**

| Variable                                                           | Small  | Medium | Large |
|--------------------------------------------------------------------|--------|--------|-------|
| <b>Milk Chilling Equipment</b>                                     |        |        |       |
| Used milk chilling equipment                                       | 18.79% | 58.33% | 100%  |
| <b>Potential Source for Replacement of Milk Chilling Equipment</b> |        |        |       |
| Venture37                                                          | 56.03% | 76.19% | 0%    |
| Imported                                                           | 13.08% | 30.00% | 0%    |
| Local commercial supplier                                          | 22.02% | 33.33% | 0%    |
| Local market                                                       | 20.51% | 33.33% | 100%  |
| Cooperative                                                        | 35.09% | 14.29% | 0%    |
| Other                                                              | 4.72%  | 0%     | 100%  |
| N                                                                  | 117    | 21     | 1     |
| <b>Milk Filters</b>                                                |        |        |       |
| Used milk filter                                                   | 73.68% | 87.50% | 100%  |
| <b>Potential Source for Replacement of Milk Filters</b>            |        |        |       |
| Venture37                                                          | 75.57% | 86.36% | 0%    |
| Imported                                                           | 12.28% | 23.81% | 0%    |
| Local commercial supplier                                          | 31.71% | 50.00% | 0%    |
| Local market                                                       | 11.76% | 22.73% | 0%    |
| Cooperative                                                        | 50.39% | 38.10% | 0%    |
| Other                                                              | 3.05%  | 0%     | 100%  |
| N                                                                  | 131    | 22     | 1     |
| <b>Milk Feeders</b>                                                |        |        |       |
| Used milk feeder                                                   | 45.70% | 62.50% | 0%    |
| <b>Potential Source for Replacement of Milk Feeders</b>            |        |        |       |
| Venture37                                                          | 62.41% | 61.90% | 0%    |
| Imported                                                           | 8.47%  | 38.10% | 0%    |
| Local commercial supplier                                          | 37.90% | 68.18% | 0%    |
| Local market                                                       | 20.00% | 27.27% | 0%    |
| Cooperative                                                        | 42.31% | 23.81% | 0%    |
| Other                                                              | 7.86%  | 9.09%  | 100%  |
| N                                                                  | 133    | 22     | 1     |

*Note: The sample is limited to all midterm farmers who identified at the time of the survey that they currently owned dairy cows, regardless of whether they were matched to baseline. We define farm scale as the midterm level. Multiple responses were permitted so percentages add up to greater than 100%.*

### 3.2.5 Breeding Methods for Dairy Cattle

**Exhibit 28** reports on use of and ease of access to various breeding methods for the matched sample and the new midterm farmers. There was no change in the use of artificial insemination (AI) from baseline to midterm. About a third of all small- and medium-scale farmers used AI at baseline, and a similar proportion used AI at midterm. We asked about ease of access to AI only at midterm. About 60 percent of small-scale farmers reported finding it easy or somewhat easy to access AI. For new midterm farmers, the proportion using AI was slightly larger at 51 percent, and 76 percent reported finding it easy or somewhat easy to access AI.

With respect to natural breeding, we find no change from baseline to midterm for small farmers. More than 60 percent of small-scale farmers used natural breeding in both evaluation rounds. There was an increase in the use of natural breeding by medium-scale farmers from 77 percent at baseline to 93 percent at midterm, but the difference is not statistically significant. Medium-scale farmers also found

it easy to buy heifers for dairy production, with the ease of access increasing from 21 percent at baseline to 46 percent at midterm (not statistically significant).

**Exhibit 29**, on the service providers used by farmers for AI services, shows an increase in the proportion of small-scale farmers using a private veterinarian, from none at baseline to 17 percent at midterm. This increase has been accompanied by a concomitant decline in use of Venture37 for AI services, from 68 percent at baseline to 47 percent at midterm (significant at the 5 percent level). For medium-scale farmers, the same trend holds. There has been an increase in use of private veterinarians and a decline in use of Venture37 for AI services.

**Exhibit 28. Use of and Ease of Access to Breeding Methods**

| Breeding Practices                              | Small    |         | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|-------------------------------------------------|----------|---------|----------|---------|--------------------|---------|---------------------|
|                                                 | Baseline | Midterm | Baseline | Midterm | Baseline           | Midterm |                     |
| Artificial Insemination                         |          |         |          |         |                    |         |                     |
| Used AI                                         | 31.71%   | 38.84%  | 35.71%   | 35.71%  | 0%                 | 0%      | 51.22%              |
| Ease of access to AI <sup>2</sup>               | N/A      | 59.57%  | N/A      | 0%      | N/A                | 0%      | 76.19%              |
| N                                               | 123      | 121     | 14       | 14      | 1                  | 1       | 41                  |
| Natural Breeding                                |          |         |          |         |                    |         |                     |
| Used natural breeding                           | 64.22%   | 65.32%  | 76.92%   | 92.85%  | 100%               | 100%    | 63.41%              |
| Ease of access to natural breeding <sup>2</sup> | N/A      | 64.63%  | N/A      | 92.31%  | N/A                | 100%    | 56.1%               |
| N                                               | 123      | 124     | 13       | 14      | 1                  | 1       | 42                  |
| Ease of access to buying a heifer               | 30.64%   | 29.75%  | 21.42%   | 46.15%  | 100%               | 100%    | 43.9%               |
| N                                               | 124      | 121     | 14       | 13      | 1                  | 1       | 41                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-response.*

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

<sup>2</sup> Question was not asked at baseline.

**Exhibit 29. Service Providers Used for Artificial Insemination**

| AI Provider                     | Small    |          | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|---------------------------------|----------|----------|----------|---------|--------------------|---------|---------------------|
|                                 | Baseline | Midterm  | Baseline | Midterm | Baseline           | Midterm |                     |
| Household member                | 5.26%    | 0%       | 0%       | 0%      | N/A                | N/A     | 9.52%               |
| Promoter                        | 15.78%   | 10.78%   | 0%       | 0%      | N/A                | N/A     | 23.81%              |
| Private contracted veterinarian | 0%       | 17.02%   | 0%       | 20%     | N/A                | N/A     | 4.76%               |
| Project (e.g. Venture37)        | 68.42%   | 46.81%** | 75%      | 40%     | N/A                | N/A     | 14.29%              |
| Livestock technicians           | 10.52%   | 27.65%** | 25%      | 40%     | N/A                | N/A     | 57.14%              |
| N                               | 38       | 47       | 4        | 5       | 0                  | 0       | 21                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .



Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-response.

<sup>1</sup> There was no response from the large farmer at midterm.

### 3.2.6 Use, Sources, and Ease of Access to Supplements

**Exhibit 30** examines the use of supplements by Venture37 project beneficiaries. Like baseline, more than 90 percent of farmers at midterm reported giving their cattle supplements. For most supplements, except salt and molasses, there was a significant increase (at the 1 percent level) from baseline to midterm. For instance, only 2 percent of farmers at baseline gave their cattle wheat bran, while 16 percent did so at midterm. The most common source for supplements at midterm was input suppliers (**Exhibit 31**). Farmers also frequently acquired supplements from other farmers.

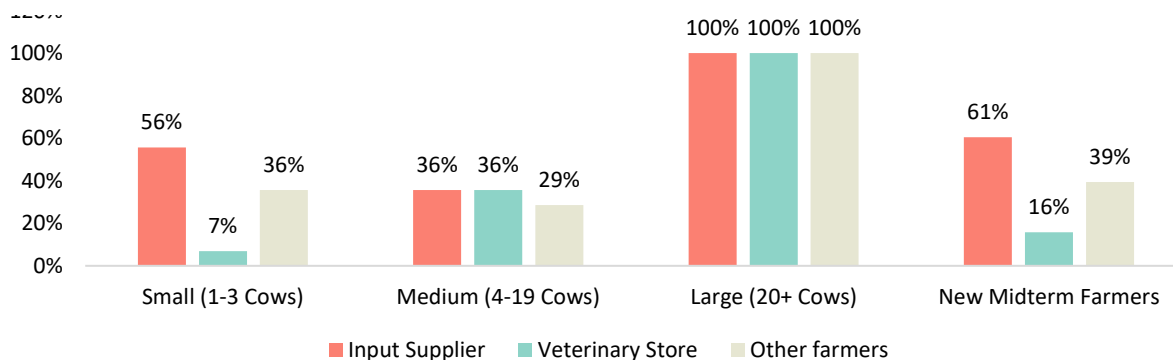
**Exhibit 30. Use of Supplements**

| Supplement Use            | Baseline Matched | Midterm Matched | New Midterm Farmers |
|---------------------------|------------------|-----------------|---------------------|
| Gave cattle supplements   | 92.14%           | 92.86%          | 90.48%              |
| N                         | 140              | 140             | 42                  |
| Salt                      | 89.92%           | 94.62%          | 92.11%              |
| Molasses                  | 27.13%           | 36.15%          | 31.58%              |
| Corn meal                 | 91.47%           | 99.23%***       | 97.37%              |
| Wheat bran                | 2.33%            | 16.28%***       | 18.42%              |
| Brewing residues          | 2.33%            | 9.60%**         | 15.79%              |
| Industrial feed ration    | 35.66%           | 63.57%***       | 56.76%              |
| Mineral blocks            | 17.05%           | 50.77%***       | 50.00%              |
| Dry crop residues         | 17.83%           | 58.14%***       | 73.68%              |
| Fresh crop residues       | 44.19%           | 60.77%***       | 73.68%              |
| Silage from crop residues | 9.30%            | 22.05%***       | 29.73%              |
| N                         | 129              | 127             | 38                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows.

**Exhibit 31. Sources of Supplements**

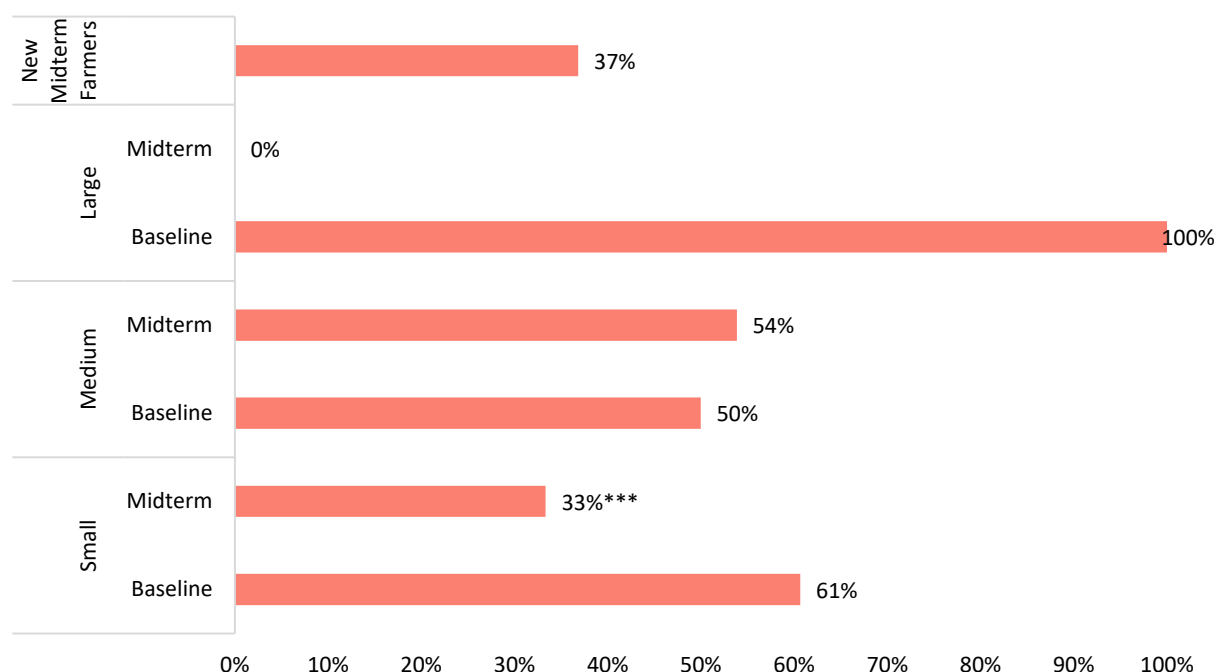


$p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses. Since there is only one larger farmer from baseline who matched to midterm, a t-test is not meaningful  
N = Small (115 at midterm); Medium (14 at midterm); Large (1 at midterm); and New Midterm (38).

As outlined in **Exhibit 32**, the proportion of small-scale farmers who felt that getting supplements was easy or very easy fell from 61 percent to 33 percent (significant at the 1 percent level). There was a small increase for medium-scale farmers, from 50 percent at baseline to 54 percent at midterm, though the difference is not statistically significant. Among new midterm farmers, only about a third (35 percent) found it easy to access supplements. This decline in ease of access is in line with Venture37's sustainability strategy wherein farmers have to explore other sources of supplements rather than just relying on Venture37. However, it will be important to monitor this ease of access and ensure that the most vulnerable farmers are not affected adversely in the medium-run.

**Exhibit 32. Ease of Access to Supplements**



\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful. N = Small (89 at baseline, 114 at midterm); Medium (12 at baseline, 13 at midterm); Large (1 at baseline, 1 at midterm); and New Midterm (38).*

### 3.3 Animal Health Services

This section discusses animal health testing, vaccinations, common illnesses such as mastitis and ticks, and ease of access to health services.

#### 3.3.1 Animal Health Testing

After discussing use, sources of, and ease of access to animal health testing, we turn to examining the common diseases farmers reported that their cattle suffered in the last 12 months and the diseases for which they conducted testing. Then we report on the use of antibiotics and withdrawal of milk from sale.

### ***Use, Source, and Ease of Access to Animal Health Testing***

**Exhibit 33** explores the utilization of animal health testing by MERCADO project beneficiaries and the service providers they used. Among the matched sample, no significant difference in the proportion of farmers who conducted health testing from baseline to midterm was witnessed. As at baseline, the use of animal health testing increased with the scale of production. About 63 percent of small-scale farmers at baseline conducted health testing, and a little under two-thirds did so at midterm. Close to 80 percent of medium-scale farmers conducted health testing in both rounds. The one large-scale farmer in our matched sample conducted health testing at both baseline and midterm. Finally, a high proportion of new midterm farmers also conducted health testing (76 percent).

Findings on providers used for health testing show a significant increase in the proportion of small-scale farmers using household members for testing. At baseline only about 8 percent used household members, but at midterm the proportion was almost 21 percent (significant at the 5 percent level). Additionally, there was a significant increase in the share of small-scale farmers who used a private veterinarian to conduct health testing, from three percent at baseline to almost 10 percent at midterm. There was an increase in the use of private veterinarians among medium—scale farmers too. There was a decline in the usage of the Venture37 project from baseline to midterm across all farm scales, but none of these decreases were significant. This indicates a potential area of sustainability if farmers are more confident in their own skills and turning to the private market for testing services, rather than relying on the project for support.

With respect to ease of access to animal health testing, we find an improvement for small farmers. At baseline, 39 percent of small-scale farmers found it easy or very easy to access animal health services, while at midterm 48 percent found it easy or very easy. There is also an improvement for medium-scale farmers from 50 percent at baseline to 69 percent at midterm. Around 60 percent of new midterm farmers also found it easy or very easy to access health services.

**Exhibit 33. Use of and Service Providers for Animal Health Testing**

| Health Testing                             | Small    |          | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|--------------------------------------------|----------|----------|----------|---------|--------------------|---------|---------------------|
|                                            | Baseline | Midterm  | Baseline | Midterm | Baseline           | Midterm |                     |
| Conducted health testing                   | 62.90%   | 66.39%   | 78.57%   | 85.71%  | 100%               | 100%    | 75.61%              |
| N                                          | 124      | 122      | 14       | 14      | 1                  | 1       | 41                  |
| <b>If Conducted, Service Provider Used</b> |          |          |          |         |                    |         |                     |
| Household member                           | 7.69%    | 20.99%** | 45.45%   | 41.67%  | 0%                 | 100%    | 32.26%              |
| Promoter                                   | 33.33%   | 16.05%** | 27.27%   | 8.33%   | 0%                 | 0%      | 9.68%               |
| Private veterinarian                       | 2.56%    | 9.88%*   | 36.36%   | 41.67%  | 0%                 | 0%      | 16.13%              |
| Venture37                                  | 23.08%   | 20.99%   | 9.09%    | 0%      | 0%                 | 0%      | 16.13%              |
| Livestock technicians                      | 42.31%   | 40.74%   | 36.36%   | 16.67%  | 100%               | 100%    | 38.71%              |
| N                                          | 78       | 81       | 11       | 12      | 1                  | 1       | 31                  |
| <b>Ease of Access</b>                      |          |          |          |         |                    |         |                     |
| Easy or very easy to access services       | 38.71%   | 47.54%   | 50.00%   | 69.23%  | 100%               | 100%    | 58.54%              |
| N                                          | 124      | 122      | 14       | 13      | 1                  | 1       | 41                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup>Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

### Common Diseases

**Exhibit 34** shows the animal health issues identified by MERCADO project beneficiaries. For small farmers, there was a small but not a statistically significant increase in the proportion who identified if their cattle had any wounds or illness in the last 12 months. At baseline, 20 percent of small-scale farmers reported having dairy cattle with sickness or wounds; at midterm this proportion rose to 28 percent. For medium-scale farmers the increase was higher, from 36 percent at baseline to 71 percent at midterm (significant at the 1 percent level). There are two potential reasons for the increase in animal health issues over the past 12 months. One reason is that farmers can now more readily identify when their cows are sick. The second potential reason could be an increase in disease because of Cyclone Idai.

With respect to type of illness, the proportion of small and medium-scale farmers reporting mastitis rose from baseline to midterm. For small farmers, the proportion reporting their cattle had suffered from wounds declined significantly from 84 percent at baseline to 30 percent at midterm. In addition to mastitis, small farmers saw an increase in tick-borne diseases and diarrhea. Medium-scale farmers saw a rise in wounds and diarrhea. The sample sizes for those reporting the ailments suffered by their cattle are, however, too small to draw any definitive conclusions.

**Exhibit 35** examines four common diseases for which dairy farmers tested: brucellosis, tuberculosis, mastitis, and tick-borne diseases. For small-scale farmers, the proportion who tested for brucellosis increased significantly (at the 1 percent level) from 19 percent at baseline to 41 percent at midterm. In general, the proportion of small farmers reporting other diseases did not change significantly from baseline to midterm. Around half of the small farmers tested for tuberculosis, around 67 percent tested for mastitis, and about 37 percent tested for tick-borne diseases at midterm. The proportion of medium-

scale farmers who tested for diseases generally declined. Around 82 percent tested for brucellosis at baseline, while only 42 percent did so at midterm (significant at the 10 percent level). The proportion of medium-scale farmers testing for tuberculosis fell from 55 percent at baseline to 33 percent at midterm. Results for new midterm farmers show that about 45 percent tested for brucellosis, 52 percent for tuberculosis, 61 percent for mastitis, and 48 percent for tick-borne diseases.

**Exhibit 34. Animal Health Issues Suffered**

| Animal Health Issues                     | Small    |           | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|------------------------------------------|----------|-----------|----------|---------|--------------------|---------|---------------------|
|                                          | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |                     |
| Had dairy cattle with sickness or wounds | 20.16%   | 27.50%    | 35.71%   | 71.43%* | 100%               | 100%    | 39.02%              |
| N                                        | 124      | 120       | 14       | 14      | 1                  | 1       | 41                  |
| Mastitis                                 | 48.00%   | 63.64%    | 40.00%   | 50.00%  | 100%               | 0%      | 62.50%              |
| Wounds                                   | 84.00%   | 30.30%*** | 40.00%   | 50.00%  | 100%               | 100%    | 50.00%              |
| Conjunctivitis                           | 4.00%    | 3.03%     | 40.00%   | 20.00%  | 0%                 | 100%    | 25.00%              |
| Tick-borne diseases                      | 4.00%    | 21.21%*   | 80.00%   | 50.00%  | 0%                 | 0%      | 31.25%              |
| Diarrhea                                 | 24.00%   | 21.21%    | 60.00%   | 70.00%  | 100%               | 100%    | 31.25%              |
| N                                        | 25       | 33        | 5        | 10      | 1                  | 1       | 16                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

**Exhibit 35. Animal Health Issues Tested**

| Animal Health Issues | Small    |           | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|----------------------|----------|-----------|----------|---------|--------------------|---------|---------------------|
|                      | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |                     |
| Brucellosis          | 19.23%   | 40.74%*** | 81.82%   | 41.67%* | 0%                 | 100%    | 45.16%              |
| Tuberculosis         | 52.56%   | 50.62%    | 54.55%   | 33.33%  | 100%               | 0%      | 51.61%              |
| Mastitis             | 64.10%   | 66.67%    | 72.73%   | 58.33%  | 100%               | 100%    | 61.29%              |
| Tick-borne diseases  | 25.64%   | 37.04%    | 45.45%   | 41.67%  | 100%               | 0%      | 48.39%              |
| N                    | 78       | 81        | 11       | 12      | 1                  | 1       | 31                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned cows. Since farm scale is endogenous and is affected by the MERCADO project, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> Since there is only one larger farmer from baseline who matched to midterm, a t-test is not meaningful.

### **Antibiotics and Withdrawal from Milk Sales**

**Exhibit 36** examines the use of antibiotics and withdrawal of milk from sale for the matched sample and the new midterm farmers. There was no change in the proportion of small-scale farmers in our matched sample using injectable antibiotics: around 43 percent at midterm compared to 40 percent at baseline. For medium-scale farmers, the use of antibiotics increased from 64 percent at baseline to 85 percent at midterm; the difference is not statistically significant. Results show a significant increase in the

proportion of small-scale farmers who withdrew their milk from sale or consumption after using antibiotics, from 22 percent at baseline to 60 percent at midterm (significant at the 1 percent level). A higher proportion of medium-scale farmers also withdrew their milk, from 33 percent at baseline to 55 percent at midterm, though the difference is not statistically significant. These increases are encouraging because they indicate greater knowledge about the pitfalls of consuming milk from cows treated with injectable antibiotics.

**Exhibit 36. Use of Antibiotics and Withdrawal of Milk from Sale**

| Variable                                                                  | Small    |           | Medium   |         | Large <sup>1</sup> |         | New Midterm farmers |
|---------------------------------------------------------------------------|----------|-----------|----------|---------|--------------------|---------|---------------------|
|                                                                           | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |                     |
| Used injectable antibiotics on lactating cows                             | 40.32%   | 42.86%    | 64.29%   | 84.62%  | 100%               | 100%    | 38.89%              |
| N                                                                         | 124      | 112       | 14       | 13      | 1                  | 1       | 36                  |
| Withdrew milk from sale or consumption after using injectable antibiotics | 22.00%   | 60.42%*** | 33.30%   | 54.55%  | 100%               | 100%    | 57.14%              |
| N                                                                         | 50       | 48        | 9        | 11      | 1                  | 1       | 14                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup>Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

### 3.3.2 Vaccinations

**Exhibit 37** shows the frequency of vaccinations for MERCADO project beneficiaries. For small-scale farmers, there is a marginally significant increase (at the 10 percent level) in the proportion who vaccinated their cows, from 75 percent at baseline to 84 percent at midterm. There is also an increase for medium-scale farmers, from 79 percent at baseline to 93 percent at midterm, but the difference is not statistically significant. Finally, the one large farmer in our sample vaccinated both as baseline and at midterm. While the percentage of small farmers who provide only the required vaccinations to their cows declined significantly, the percentage of farmers who provided additional vaccinations increased, signaling an increase in awareness of vaccination among small farmers. The increase in the additional vaccinations for small farmers came from higher rates of vaccinating for lumpy skin disease, from 12 percent at baseline to 47 percent at midterm (significant at the 1 percent level); brucellosis, from 11 percent at baseline to 56 percent at midterm (significant at the 5 percent level); and anthrax, from 14 percent at baseline to 49 percent at midterm (significant at the 1 percent level). For medium-scale farmers, the proportion who vaccinated for brucellosis increased the most, from 18 percent at baseline to 75 percent at midterm (significant at the 1 percent level).

### Exhibit 37. Frequency of Vaccinations

| Vaccinations               | Small    |           | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|----------------------------|----------|-----------|----------|---------|--------------------|---------|---------------------|
|                            | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |                     |
| Vaccinated cows            | 75.00%   | 83.61%*   | 78.57%   | 92.86%  | 100%               | 100%    | 90.48%              |
| N                          | 124      | 122       | 14       | 14      | 1                  | 1       | 42                  |
| If Yes, Types of Vaccines  |          |           |          |         |                    |         |                     |
| Required vaccinations only | 100%     | 93.02%**  | 90.91%   | 91.67%  | 100%               | 100%    | 88.24%              |
| Foot and mouth vaccine     | 80.65%   | 85.94%    | 90.91%   | 66.67%  | 100%               | 100%    | 81.48%              |
| Lumpy skin disease vaccine | 11.83%   | 45.61%*** | 36.36%   | 50.00%  | 100%               | 100%    | 42.31%              |
| Brucellosis vaccine        | 10.75%   | 55.56%**  | 18.18%   | 75%***  | 100%               | 100%    | 65.38%              |
| Anthrax vaccine            | 13.98%   | 49.12%*** | 36.98%   | 62.5%   | 100%               | 100%    | 55.56%              |
| N                          | 93       | 86        | 11       | 12      | 1                  | 1       | 34                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup>Since there is only one large farmer from basely ne who matched to midterm, a comparison is not meaningful.

**Exhibit 38** explores the service providers used for vaccinations. Once again, as for providers of AI services (**Exhibit 29**), there has been an increase in small- and medium-scale farmers using private contracted veterinarians. For small-scale farmers, there was an increase from less than 1 percent at baseline to almost 10 percent at midterm (significant at the 1 percent level). For medium-scale farmers, use of private veterinarians increased from 7 percent at baseline to 50 percent at midterm (significant at the 10 percent level). As with AI services, we see this increase accompanied by a decline in use of Venture37 for vaccinations for small-scale farmers: 17 percent used Venture37 at baseline and 10 percent at midterm (significant at the 10 percent level). For medium-scale farmers, there seems to be a slight increase from no use of Venture37 at baseline to 7 percent at midterm, but this improvement is not statistically significant, possibly due to small numbers. For new midterm farmers, a livestock technician was the most common service provider (62 percent), followed by Venture37 and private veterinarians (14 percent each). As with animal health testing, the increase in using the private market for vaccinations may be a positive indication that farmers have more options and are less reliant on Venture37 to provide health services.



**Exhibit 38. Service Provider Used for Vaccinations**

| Vaccination Provider            | Small    |              | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|---------------------------------|----------|--------------|----------|---------|--------------------|---------|---------------------|
|                                 | Baseline | Midterm      | Baseline | Midterm | Baseline           | Midterm |                     |
| Household member or employee    | 1.60%    | 0.80%        | 14.29%   | 0%      | 0%                 | 0%      | 0%                  |
| Promoter                        | 12.80%   | 10.40%       | 0%       | 7.14%   | 0%                 | 0%      | 2.38%               |
| Private contracted veterinarian | 0.80%    | 9.60%**<br>* | 7.14%    | 50.00%* | 0%                 | 100%    | 14.29%              |
| Venture37                       | 16.80%   | 9.60%*       | 0%       | 7.14%   | 0%                 | 0%      | 14.29%              |
| Livestock technician            | 41.60%   | 49.60%       | 71.43%   | 35.71%* | 100%               | 0%      | 61.9%               |
| N                               | 125      | 125          | 14       | 14      | 1                  | 1       | 42                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup>Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

### 3.3.3 Mastitis and Ticks

**Exhibit 39** shows no significant change in the percentages of farmers of any scale who reported that they test their cattle for mastitis. Medium-scale farmers reported improvement in testing in midterm over baseline, but the results are not significant, possibly due to small numbers. Among the small-scale farmers, the lack of change in testing seems to be the outcome of two opposing forces: a significant decrease in visual testing and a significant increase in the use of the California Mastitis Test (CMT), a simple indicator of the somatic cell count of milk<sup>45</sup> using a test kit. Though the percentage of small farmers who tested for mastitis did not increase, more of them used the more sophisticated CMT at midterm instead of visual testing.<sup>46</sup> The proportion of medium-scale farmers who used CMT also increased from baseline to midterm, though not significantly. The new midterm farmers also show high usage of CMT, a finding that confirms high uptake of these testing kits across all farmers.

<sup>45</sup> <http://www.fao.org/3/t0218e/t0218e04.htm>

<sup>46</sup> Visual testing involves merely squirting milk on the floor to detect signs of infected milk such as blood in milk. A cup test is more sophisticated wherein you squirt samples into a special cup with a mesh screen in order to discover if there are clots, which show up clearly on the black-colored mesh screen. Finally, the CMT is the highest level of sophistication wherein each of the four teats are tested by squirting in a four-part plate and using a reagent for testing.

### Exhibit 39. Type of Mastitis Testing

| Mastitis Test               | Small    |           | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|-----------------------------|----------|-----------|----------|---------|--------------------|---------|---------------------|
|                             | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |                     |
| Did test for Mastitis       | 77.42%   | 74.38%    | 78.57%   | 92.86%  | 0%                 | 0%      | 80.49%              |
| N                           | 124      | 121       | 14       | 14      | 1                  | 1       | 41                  |
| If Tested, Types of Testing |          |           |          |         |                    |         |                     |
| Visual test                 | 55.2%    | 40.91%**  | 36.36%   | 38.46%  | 0%                 | 0%      | 48.48%              |
| Cup test                    | 32.29%   | 40.45%    | 18.18%   | 30.77%  | 100%               | 0%      | 31.25%              |
| CMT                         | 27.08%   | 69.32%*** | 81.82%   | 92.32%  | 0%                 | 0%      | 81.82%              |
| N                           | 96       | 88        | 11       | 13      | 1                  | 1       | 33                  |

$p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous and is affected by the MERCADO project, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

Farmers can detect mastitis inflammation by simple tests on cow's milk using a test kit/strip. **Exhibit 40** reports on the sources of CMT kits accessed by farmers. The percentage of small farmers who sourced CMT kits from Venture37 increased significantly from baseline (48 percent) to midterm (79 percent). Similarly, the percentage of small farmers who used imported CMT kits increased significantly from none to more than 15 percent. We see an offset in this increase by the decrease in small farmers who sourced CMT kits from local markets, from almost half at baseline to less than 8 percent at midterm. Medium-scale farmers show similar results, with a significant increase in the proportion who used imported kits and a significant decline in sourcing from a local market. The sources of the kit among new midterm farmers are similar to those of the matched small farmers.

**Exhibit 41** explores the frequency of tick treatment and its service providers. There is no significant change in the percentage of either small- or medium-scale farmers who treated for ticks between baseline and midterm. However, the direction of change is positive: an increase for medium-scale farmers from 71 percent at baseline to 92 percent at midterm and for small-scale farmers from 55 percent at baseline to 60 percent at midterm.

### Exhibit 40. Sources of Mastitis Testing Kit

| Testing Kit Source | Small    |           | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|--------------------|----------|-----------|----------|---------|--------------------|---------|---------------------|
|                    | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |                     |
| Venture37          | 48.00%   | 79.45%*** | 33.33%   | 58.33%  | 0%                 | 100%    | 74.19%              |
| Imported           | 0%       | 15.07%*** | 0%       | 27.27%* | 0%                 | 100%    | 29.63%              |
| Local supplier     | 48.00%   | 43.06%    | 33.33%   | 66.67%  | 0%                 | 100%    | 40.74%              |
| Local market       | 48.00%   | 7.89%***  | 33.33%   | 0%**    | 0%                 | 0%      | 3.70%               |
| Cooperative        | 48.00%   | 55.84%    | 33.33%   | 8.33%   | 0%                 | 100%    | 53.57%              |
| N                  | 50       | 77        | 9        | 12      | 1                  | 1       | 31                  |

$p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. Multiple responses were allowed, so responses can add up to more than 100%. The sample sizes differ between baseline and midterm because of different rates of non-response.

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

**Exhibit 41. Frequency of and Service Providers for Tick Treatment**

| Tick Treatment                           | Small    |         | Medium   |         | Large <sup>1</sup> |         | New<br>Midterm<br>Farmers |
|------------------------------------------|----------|---------|----------|---------|--------------------|---------|---------------------------|
|                                          | Baseline | Midterm | Baseline | Midterm | Baseline           | Midterm |                           |
| Treated cows for ticks                   | 54.84%   | 60.18%  | 71.43%   | 92.13%  | 100%               | 100%    | 81.08%                    |
| N                                        | 124      | 113     | 14       | 13      | 1                  | 1       | 37                        |
| <b>If Treated, Service Provider Used</b> |          |         |          |         |                    |         |                           |
| Household member                         | 26.47%   | 35.29%  | 60%      | 58.33%  | 100%               | N/A     | 60%                       |
| Private veterinarian                     | 1.47%    | 2.94%   | 10%      | 0%      | 0%                 | N/A     | 3.33%                     |
| Venture37                                | 5.88%    | 13.24%  | 0%       | 8.33%   | 0%                 | N/A     | 0%                        |
| N                                        | 68       | 68      | 10       | 12      | 1                  | 0       | 30                        |

$p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

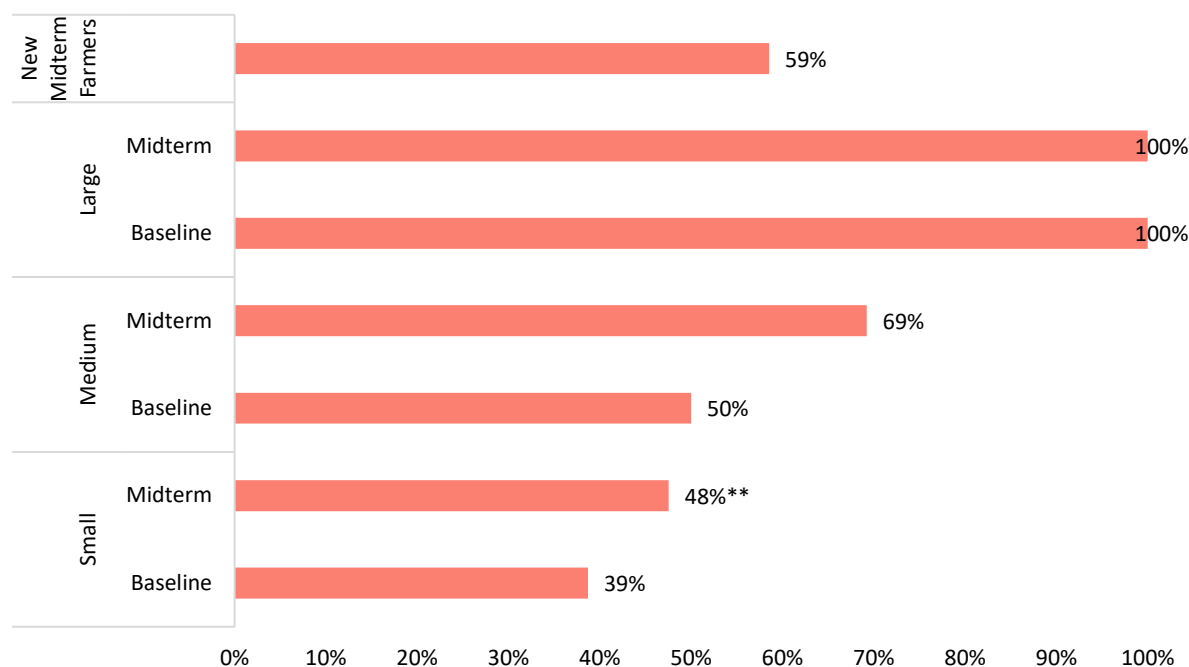
*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-response.*

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

### 3.3.4 Ease of Access to Cattle Health Services

**Exhibit 42** presents the results for ease of access to health service. Only small-scale farmers saw a statistically significant increase in ease of access to health services from baseline to midterm. The lack of significance on medium-scale farmers could be driven by low sample sizes rather than lack of change in ease of access. Almost half of small-scale farmers at midterm reported that it was easy for them to access health services, compared to less than 40 percent at baseline. The percentage point difference was larger for medium-scale farmers, 69 percent of whom reported easy access to health services at midterm compared to half at baseline. Almost 60 percent of the new midterm farmers reported easy access to health services.

**Exhibit 42. Ease of Access to Cattle Health Services**



$p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses. Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful. N = Small (124 at baseline, 122 at midterm); Medium (14 at baseline, 13 at midterm); Large (1 at baseline, 1 at midterm); New Midterm (41).*

### 3.4 Engagement with MERCADO

In this section, we detail the extent of engagement project beneficiaries at midterm had with the MERCADO project. First, we discuss overall engagement with MERCADO; then we examine changes in dairy production, followed by changes in housing, water use, feeding, health services, and breeding. We conclude this section by discussing the trainings provided under MERCADO and the extent to which MERCADO has increased the knowledge base of its beneficiaries. As a note, we cannot causally attribute any changes to the MERCADO project and we only report self-reported changes by farmers based on their experience with MERCADO.

We asked questions about engagement with MERCADO only at midterm. Therefore, except where explicitly mentioned, this section includes all midterm farmers who had dairy cows, whether we matched them to baseline or not. Further, we define farm scale as the midterm value.

#### 3.4.1 Overall Engagement

As reported in **Exhibit 43**, a large proportion of the farmers at midterm were aware of the MERCADO project: about 66 percent of small-scale farmers and 91 percent of medium-scale farmers. The one large-scale farmer in our midterm sample was also aware of the project. The most common type of engagement for farmers of all types was trainings provided by the project. We detail the types of

training in **Section 3.4.4**. A large proportion of medium-scale farmers (41 percent) reported connections to input suppliers due to their involvement with MERCADO. Finally, both small- and medium-scale farmers reported that they became part of a dairy cooperative due to MERCADO (41 percent of small-scale farmers and 45 percent of medium farmers).

**Exhibit 43. Engagement with MERCADO Project**

| MERCADO Engagement <sup>1</sup>        | Small  | Medium | Large |
|----------------------------------------|--------|--------|-------|
| Aware of MERCADO project               | 65.79% | 91.30% | 100%  |
| N                                      | 152    | 23     | 1     |
| <b>If Aware, Type of Engagement</b>    |        |        |       |
| Received trainings on dairy production | 94.29% | 95.45% | 100%  |
| Was connected to input suppliers       | 26.67% | 40.91% | 100%  |
| Was connected to buyers and exporters  | 14.29% | 18.18% | 0%    |
| Received inputs directly               | 14.29% | 27.27% | 0%    |
| Became part of a dairy cooperative     | 40.95% | 45.45% | 0%    |
| N                                      | 105    | 22     | 1     |

*Note: The sample includes all farmers who identified at the time of the survey that they currently owned dairy cows, regardless of whether they were matched to baseline or not. The largest farm in the sample, with over 250 cows, is excluded because it is an extreme outlier. Multiple responses were allowed, so responses add up to more than 100%. Farm scale is defined as the midterm level.*

### 3.4.2 Changes in Dairy Production due to MERCADO

**Exhibit 44** examines changes in dairy production and related matters based on their experience with the MERCADO project. For more than half the midterm sample (55 percent), milk production per cow increased based on their experience with the MERCADO project. For about 24 percent, milk production stayed the same, and for 16 percent, milk production declined. The proportion of midterm farmers for whom the total income from dairy increased was similar. For 48 percent of farmers, income from dairy increased after the project. However, for about a quarter (26 percent), there was no change. Importantly, 16 percent reported a decline in income from dairy based on their experience with MERCADO.

We also examined whether access changed after the MERCADO project. We defined access in three ways: access to information, access to buyers, and access to dairy inputs. We found that access to information increased the most, with 52 percent of farmers reporting an increase based on their experience with MERCADO. With respect to access to buyers and dairy inputs, a higher proportion of farmers reported no impact based on their experience with MERCADO. Around 43 percent of farmers reported no change in access to buyers and 45 percent reported no change in access to inputs. These findings suggest that the project had a limited impact on access, except for some improvement in access to information.

**Some members prefer to sell their milk individually and not use the cooperative channel. The reason is the large buyers sometimes do not pay, or take a long time to pay. This demoralizes the farmers.**

**-Farmer and cooperative leader**

The qualitative data confirms this finding; farmers expressed frustration with their access to buyers, citing limits in their ability to sell their milk to buyers in the formal dairy chain. As a result, many said they “side-sold” a portion of their milk; that is, they sold directly to friends and community members before delivering the rest to their cooperatives.

#### Exhibit 44. Changes in Dairy Production and Access Based on Experience with MERCADO

| MERCADO Factor          | Increased | Decreased | Stayed the Same |
|-------------------------|-----------|-----------|-----------------|
| Milk production per cow | 54.69%    | 15.63%    | 24.22%          |
| Total income from dairy | 48.44%    | 16.41%    | 25.78%          |
| Access to information   | 52.34%    | 11.72%    | 28.91%          |
| Access to buyers        | 39.06%    | 10.94%    | 42.97%          |
| Access to dairy inputs  | 35.16%    | 14.06%    | 45.31%          |
| N                       | 128       | 128       | 128             |

*Note: The sample includes all farmers who identified at the time of the survey that they currently owned dairy cows, regardless of whether they were matched to baseline or not. The largest farm in the sample, with over 250 cows, is excluded because it is an extreme outlier. Multiple responses were allowed, so responses add up to more than 100%. Farm scale is defined as the midterm level.*

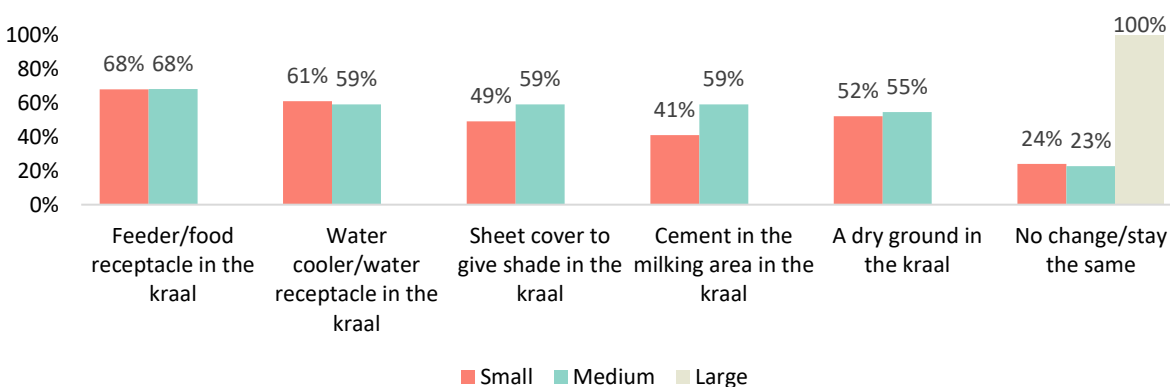
### 3.4.3 Changes in Housing, Water Use, Feeding, Health Services, and Breeding due to MERCADO

#### Changes in Housing and Water Use

Exhibit 45 shows that farmers started adopting better cattle housing practices based on their experience with the MERCADO project. More than 68 percent of small- and medium-scale farmers started keeping a feeder or food receptacle in the kraal based on their experience with the MERCADO project. Large proportions (61 percent of small-scale and 59 percent of medium-scale farmers) also started keeping a water cooler or receptacle in the kraal. Other housing practices also improved, including hanging a sheet to provide shade in the kraal and cementing the milking area, with more than 40 percent of farmers having adopted these practices, on average.

With respect to water use, as for housing, farmers started adopting improved water practices, to the extent possible given natural resource constraints. Around 68 percent of midterm farmers reported bringing more water to cattle based on their experience with the MERCADO project. Eleven percent of the sample reported continuous water use. This is unsurprising given frequent water shortages in the region and the lack of irrigation systems on many farms.

Exhibit 45. Changes in Housing for Cows Based on Experience with MERCADO

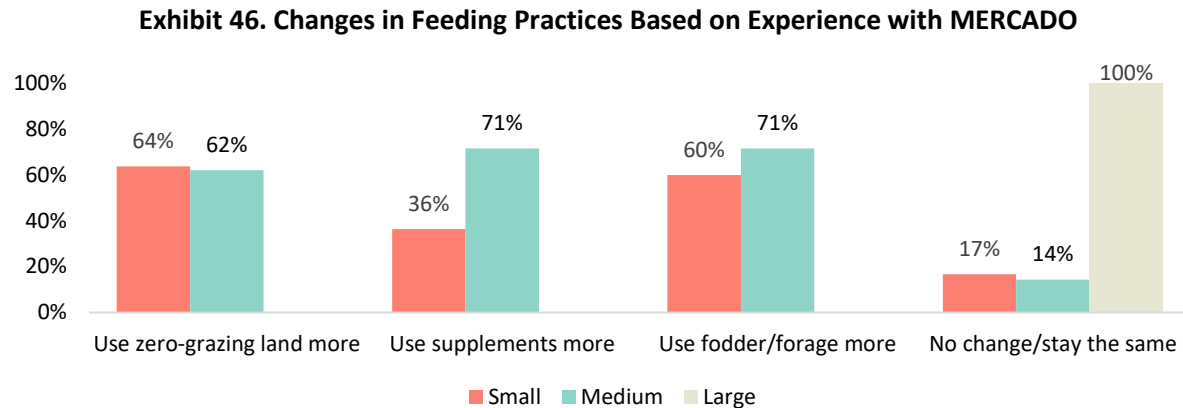


*Note: The sample includes all farmers who identified at the time of the survey that they currently owned dairy cows, regardless of whether they were matched to baseline or not. The largest farm in the sample, with over 250 cows, is excluded because it is an extreme outlier. Multiple responses were allowed, so responses add up to more than 100%. Farm scale is defined as the midterm level.*

*N = Small (99); Medium (22); Large (1)*

### Changes in Feeding

**Exhibit 46** examines changes in cow feeding based on their experience with the MERCADO project. Even though Venture37 has scaled back its focus on zero-grazing, awareness of this scale-back seems to be low: More than 60 percent of small- and medium-scale farmers reported having adopted zero-grazing based on their experience with the MERCADO project. With respect to supplements, while only 36 percent of small-scale farmers started using supplements, almost 71 percent of medium-scale farmers used supplements after being associated with MERCADO. For the one large-scale farmer in our sample, there was no change in feeding practices based on their experience with MERCADO.



*Note: The sample includes all farmers who identified at the time of the survey that they currently owned dairy cows, regardless of whether they were matched to baseline or not. The largest farm in the sample, with over 250 cows, is excluded because it is an extreme outlier. Multiple responses were allowed, so responses add up to more than 100%. Farm scale is defined as the midterm level.*

*N = Small (101); Medium (21); Large (1)*

### Changes in Breeding and Animal Health Services

We report changes in breeding and animal health services due to MERCADO in **Exhibit 47**. In general, farmers adopted both natural breeding and AI due to the MERCADO project. Among small-scale farmers, a little over half of the small farmers adopted natural breeding (58 percent) while a little over one third of them (36%) adopted AI. Among medium-scale farmers, similar proportions adopted natural breeding (60 percent) and AI (40 percent).

With respect to animal health services, weekly tick treatments increased due to the MERCADO project, with over 68 percent of medium-scale and 51 percent of small-scale farmers reporting having started such treatments. Additionally, vaccination of cattle was positively influenced by the project with 35 percent of small-scale farmers and 59 percent of the medium scale farmers reporting vaccinating their cattle due to the MERCADO project.



#### Exhibit 47. Changes in Breeding and Animal Health Services due to MERCADO

| Variable                       | Small  | Medium | Large   |
|--------------------------------|--------|--------|---------|
| <b>Breeding</b>                |        |        |         |
| Use AI more                    | 36.36% | 40.00% | 0.00%   |
| Use natural breeding more      | 57.57% | 60.00% | 0.00%   |
| No change/stayed the same      | 18.18% | 15.00% | 100.00% |
| N                              | 99     | 20     | 1       |
| <b>Animal Health Services</b>  |        |        |         |
| Started weekly tick treatments | 50.51% | 68.18% | 0.00%   |
| Started vaccinating cattle     | 45.36% | 59.09% | 0.00%   |
| No change/stayed the same      | 35.05% | 22.72% | 100.00% |
| N                              | 97     | 22     | 1       |

*Note: The sample includes all farmers who identified at the time of the survey that they currently owned dairy cows, regardless of whether they were matched to baseline or not. The largest farm in the sample, with over 250 cows, is excluded because it is an extreme outlier. Multiple responses were allowed, so responses add up to more than 100%. Farm scale is defined as the midterm level.*

### 3.4.4 Training and Knowledge

#### **Training**

At midterm, 55 percent of the small-scale farmers, 71 percent of medium-scale farmers, and the one large-scale farmer reported having received some training under the MERCADO project (**Exhibit 48**). Of the small-scale farmers who received training, three-fourths received training in fodder production (76 percent) and improved animal husbandry (77 percent), and around half received training in improved farm management (48 percent) and improved farming practices (56 percent). Further, almost a quarter received training in improved agricultural productivity (23 percent), input supply (23 percent), and food security (24 percent); 12 percent received training in post-harvest handling. Of the medium-scale farmers who received training, most received training on fodder production (82 percent), improved dairy husbandry (76 percent), improved farming practices (71 percent), and improved farm management (65 percent). Thus, fodder production and dairy husbandry were the most common types of training for both small- and medium-scale farmers.

### Exhibit 48. Farmer Training under MERCADO

| Training                                 | Small  | Medium | Large   |
|------------------------------------------|--------|--------|---------|
| Received any MERCADO trainings           | 54.78% | 70.83% | 100.00% |
| N                                        | 158    | 23     | 1       |
| <b>If Yes, Type of Training Received</b> |        |        |         |
| Improved farming practices               | 55.81% | 70.59% | 100.00% |
| Fodder production                        | 75.58% | 82.35% | 100.00% |
| Improved dairy husbandry                 | 76.74% | 76.47% | 0.00%   |
| Improved farm management                 | 47.67% | 64.71% | 0.00%   |
| Improved agricultural productivity       | 23.26% | 29.41% | 0.00%   |
| Input supply                             | 23.26% | 29.41% | 0.00%   |
| Post-harvest handling                    | 11.63% | 23.53% | 0.00%   |
| Food security                            | 24.42% | 17.65% | 0.00%   |
| Other                                    | 2.33%  | 5.88%  | 0.00%   |
| N                                        | 86     | 17     | 1       |

*Note: N includes all midterm farmers who identified at the time of the survey that they currently owned dairy cows, regardless of if they were matched to baseline or not. We exclude the largest farm in our sample with over 250 cows because it is an extreme outlier. Multiple responses were allowed and hence responses will not add to 100%. Farm scale is defined as the midterm level.*

### Knowledge

**Exhibit 49** reports knowledge of improved dairy practices. For each knowledge indicator, we asked farmers a series of questions that would indicate how well they knew about that particular dairy practice. We created a score for each of farmer's knowledge of every single improved dairy practice based on the accuracy of their responses. Then we defined a cutoff for each knowledge indicator and considered the farmers as having knowledge of the practice if they scored above the cutoff. These scores we created at both at baseline and at midterm.<sup>47</sup>

In the matched sample, for small farmers, awareness of the ways to improve pasture quality was a little above 70 percent at midterm, significantly lower than 82 percent at baseline. There was a decline in the knowledge of advantages of AI among small farmers, as well. Knowledge of mastitis control on the other hand, showed an improvement from baseline to midterm for small farmers, but the change was not statistically significant. For the medium-scale farmers, there were no significant differences in baseline and midterm values for any of the indicators of knowledge of improved dairy practices, probably owing to the small sample size. However, the direction of the results was positive: more medium-scale farmers showed knowledge of ways to improve pasture quality and control mastitis at midterm compared to baseline. However, the proportion of medium-scale farmers who reported knowledge of the advantages of AI dropped from 79 percent at baseline to 71 percent at midterm. The large farmer in the sample showed some improvements in knowledge of improved dairy practices, though a comparison is not meaningful because there was only one large farmer who matched from baseline to midterm.

At midterm, we measured farmer's knowledge of three additional improved dairy practices: best practices in cow feeding, advantages of keeping the corral clean and ways to maintain milk quality. Among the small, medium and new farmers approximately 80 percent reported good knowledge of best cow feeding practice, approximately 75% reported good knowledge of maintaining milk quality and above 95 percent reported the knowledge of advantages of maintaining a hygienic corral.

<sup>47</sup> Specifically, farmers were considered to have "knowledge" of a practice if they could list two ways to improve pasture quality, two advantages of artificial insemination, four important equipment in a corral, and three ways to control mastitis.

It is important to note that Venture37 has been working with dairy farmers in the region for past 10 years and has provided them numerous trainings on improved dairy practices. This could possibly explain high levels of knowledge on improved dairy practices among farmers prior to the start of MERCADO project (at baseline). Possible reason for the difference in knowledge of improved practices between baseline and midterm for small farmers on ways to improve pasture quality and advantages of AI, could be lack of continuous training on these methods and lack of regular use of these methods, especially AI. As small farmers are not very well connected, they do not have many opportunities to learn about new practices and mostly rely on the training provided to them. In interviews, farmers and paravets said that learning the skills and knowledge necessary for successful dairy farming needs to be ongoing, especially for new farmers. As the owner of a large farm said, “I have been in dairy my whole life, and am still learning. Becoming a dairy farmer can’t happen overnight.” Paravets said that farmers in remote areas have difficulties attending the trainings, as the distance is too great. They said that, even if these farmers do make it to a training, they do not retain the information taught if it is theoretical and not shown in their home kraal. Finally, new midterm farmers had similar levels of awareness for most practices as the matched sample.

**Exhibit 49. Knowledge of Improved Dairy Practices**

| MERCADO Training Topic             | Small    |          | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|------------------------------------|----------|----------|----------|---------|--------------------|---------|---------------------|
|                                    | Baseline | Midterm  | Baseline | Midterm | Baseline           | Midterm |                     |
| Ways to improve pasture quality    | 81.60%   | 70.40%** | 64.28%   | 71.43%  | 100.00%            | 100.00% | 71.43%              |
| Advantages of AI                   | 81.60%   | 75.20%   | 78.57%   | 71.43%  | 100.00%            | 100.00% | 73.81%              |
| Most important equipment in corral | 80%      | 83.20%   | 78.57%   | 78.57%  | 0.00%              | 100.00% | 71.43%              |
| How to prevent or control mastitis | 85.60%   | 92.85%   | 78.57%   | 92.86%  | 100.00%            | 100.00% | 90.48%              |
| Best practices in cow feeding      | NA       | 81.60%   | NA       | 78.57%  | NA                 | 100%    | 83.33%              |
| Advantages of clean corral         | NA       | 96.80%   | NA       | 100.00% | NA                 | 100%    | 97.62%              |
| Ways to maintain milk quality      | NA       | 75.20%   | NA       | 78.57%  | NA                 | 100%    | 73.81%              |
| N                                  | 125      | 125      | 14       | 14      | 1                  | 1       | 42                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

MERCADO training also included training on financial literacy. **Exhibit 50** reports on the financial literacy of the trained farmers. In this study, we consider farmers financially literate if they demonstrate knowledge of revenues and expenses in estimating profit. Based on this definition, there was no significant difference in the financial literacy of either small-scale or medium-scale farmers from baseline to midterm. However, the direction of change is positive for medium-scale farmers, who show an improvement from 71 percent at baseline to 79 percent at midterm. The lack of significance in this finding may be due to the low sample sizes. The level of financial literacy among the new midterm farmers is 59 percent, slightly less than the percentage for matched small farmers.

### Exhibit 50. Farmer Financial Literacy

| Financial Literacy             | Small    |         | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|--------------------------------|----------|---------|----------|---------|--------------------|---------|---------------------|
|                                | Baseline | Midterm | Baseline | Midterm | Baseline           | Midterm |                     |
| Demonstrate financial literacy | 66.40%   | 63.20%  | 71.43%   | 78.57%  | 100.00%            | 100.00% | 59.52%              |
| N                              | 125      | 125     | 14       | 14      | 1                  | 1       | 42                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

## 3.5 Milk Production, Disposition, and Revenue

In this section, we begin by examining milk production and farmer productivity. We then examine volume and value of sales, discuss the different ways in which farmers allocate the milk they produce, and examine milk quality.

### 3.5.1 Milk Production

We detail in **Exhibit 51**, the proportion of farmers with no milk-producing cows and the proportion of farmers with non-responses for milk production questions. We find that more than a quarter of all farmers in the rainy and dry seasons reported that no cows produced milk. The proportion of new midterm farmers with no cows producing milk was almost 30 percent in the dry season. These farmers are automatically excluded from the milk production calculations. We also find that the non-response rate for the milk production question was around 19 percent for the matched sample across the rainy and dry seasons.

### Exhibit 51. Sample Sizes for Milk Production Questions

| Variable                                                   | Matched Sample |            | New Midterm Farmers |            |
|------------------------------------------------------------|----------------|------------|---------------------|------------|
|                                                            | Rainy Season   | Dry Season | Rainy Season        | Dry Season |
| Farmers with zero milk producing cows                      | 27.54%         | 24.29%     | 24%                 | 29%        |
| Farmers refusing to answer/do not know for milk production | 18.12%         | 20%        | 21.43%              | 23.81%     |
| N                                                          | 140            | 140        | 42                  | 42         |

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows.

There are two possible reasons for farmers not knowing or refusing to answer milk production questions. First, the production questions required very complex calculations over entire seasons. Since farmers have low education levels to start with (only 22 percent have completed primary education), these complex calculations could have resulted in some non-response. Second, the low response could also be driven by survey fatigue; production and sales questions were toward the end of a long survey instrument. As detailed in **ANNEX G**, the survey instrument at midterm was longer relative to baseline due to the addition of many new questions. Low response on this question also affects the data on volume of sales for new midterm farmers as seen in the exhibit above. One medium-scale new midterm

male farmer in this group had a large sale volume that skewed the numbers for new midterm male farmers.<sup>48</sup> To account for this skewness we changed the value for this farmer to the median value.

### ***Rainy Season***

**Exhibit 52** presents information on daily milk production per cow in the rainy season for the matched sample. At baseline, we only asked about the total number of dairy cows owned by the respondent. At midterm, in addition to asking the total number of dairy cows owned by the respondent, we also asked the number of cows that produced milk separately in the rainy and dry seasons. This information allowed us to calculate milk production per lactating cow at midterm in addition to calculating milk production per cow. Thus, we present the baseline and midterm values of daily milk production *per cow* for the matched sample in the first two columns, and we present the midterm value of daily milk production *per lactating cow* for the matched sample in the last column.

Daily production per cow declined for all categories of farmers from baseline to midterm, but the results are not statistically significant. On average, farmers reported that each cow produced 7.73 liters of milk per day at baseline and 6.89 liters per day at midterm. For small farmers, average milk production declined from 8.13 liters to 7.22 liters per cow per day. For the one large farmer in our sample, daily per cow milk production declined from 7.31 liters at baseline to 3.13 at midterm. Medium-scale farmers reported a small increase from baseline to midterm from 4.21 liters per cow per day at baseline to 4.61 liters at midterm. One important reason for this decline in milk production in the rainy season is that the last rainy season coincided with Cyclone Idai that hit Mozambique in March 2019. As we describe in **Section 3.6**, cattle death and/or cattle succumbing to disease post-Cyclone affected milk production.

Finally, with respect to gender, we restrict the sample to those farmers who self-reported their gender at baseline. This is because respondents were often spouses, children, or relatives and their gender was usually different from the gender of the actual farm owner. Thus, to reflect milk production accurately disaggregated by gender of the *farm owner* we restrict the sample to self-reporting farmers at baseline for the matched sample. On average, both men and women produce marginally less milk than they did at baseline (difference is not statistically significant).

With respect to daily milk production per lactating cow, on average in the rainy season farmers in the matched sample produced 7.90 liters per cow. This is larger than the daily milk production per cow, which was 6.89 liters. We expect this difference since daily milk production per cow uses number of dairy cows at the time of the survey, while daily milk production per lactating cow uses number of dairy cows producing milk in each season. The latter is a more accurate measurement because it only takes into account dairy cows that were giving milk for each season separately. This is particularly important since Cyclone Idai hit in March 2019, right in the middle of the rainy season. In general, the disaggregated values for milk production per lactating cow are also larger for men and women and for different farm scales; than the milk production per cow. The average number of lactating cows in the rainy season was 1.59, smaller than the total number of dairy cows reported at the time of the survey, which was 2.24 dairy cows. Thus, in general, daily milk production per lactating cow is higher than daily milk production per cow. We cannot compare daily milk production per lactating cow to baseline because of lack of baseline information.

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<sup>48</sup> The extreme values for the new midterm farmers were not changed to missing, as is standard practice, because the already low sample sizes would dip even more. We set extreme values to the median value.

**Exhibit 52. Daily Milk Production per Cow, Rainy Season (in Liters) for Matched Sample**

| Farmer Characteristics <sup>1</sup> | Dairy Production Per Cow |             | Dairy Production per Lactating Cow |
|-------------------------------------|--------------------------|-------------|------------------------------------|
|                                     | Baseline                 | Midterm     | Matched Midterm Farmers            |
| All farmers                         | 7.73 liters              | 6.62 liters | 7.07 liters                        |
| <b>Gender<sup>2</sup></b>           |                          |             |                                    |
| Female                              | 7.41 liters              | 6.72 liters | 7.00 liters                        |
| Male                                | 7.41 liters              | 6.74 liters | 7.72 liters                        |
| <b>Farm Scale</b>                   |                          |             |                                    |
| Small                               | 8.13 liters              | 6.93 liters | 7.34 liters                        |
| Medium                              | 4.21 liters              | 4.61 liters | 5.14 liters                        |
| Large <sup>3</sup>                  | 7.31 liters              | 3.13 liters | 5.00 liters                        |
| N                                   | 140                      | 59          | 57                                 |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.

<sup>1</sup> If wet production per cow or wet production per lactating cow was less than two liters, we assumed that the farmer misinterpreted the question and reported per cow production as opposed to production for all cows.

<sup>2</sup> Gender is defined as the gender of the respondent at baseline, and if the respondent self-identified as the head of the household at baseline.

<sup>3</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

Finally, we report the daily milk production per cow in the *rainy* season for the new midterm sample in **Exhibit 54**. Similar patterns hold in the new midterm sample. The average daily production of milk per cow is 6.95 liters per cow per day, while the daily milk production per lactating cow was higher at 7.58 liters.

### **Dry Season**

**Exhibit 53** shows daily milk production per cow in the *dry* season for the matched sample. There is a marginal (not statistically significant) decline from baseline to midterm. At baseline, daily milk production per cow was 7.61 liters, while at midterm daily milk production 7.07 liters per cow. For women, production per liter per cow increased from 5.86 liters at baseline to 7.85 liters at midterm. There was a slight decline in daily milk production per cow for men (not statistically significant). In terms of farm scale, there is a decline in the daily milk production per cow for small-scale and larger farmers from baseline to midterm. For medium-scale farmers there is a marginal increase from 4.98 liters per cow per day to 6.72 liters per cow per day (not statistically significant). We report the daily milk production per cow in the *dry* season for the new midterm sample in **Exhibit 54**. Similar patterns hold in the new midterm sample. The average daily production of milk per cow is 5.05 liters per cow per day, while the daily milk production per lactating cow was higher at 7.65 liters.

**Exhibit 53. Daily Milk Production per Cow, Dry Season (in Liters) for Matched Sample**

| Farmer Characteristics <sup>1</sup> | Dairy Production Per Cow |             | Dairy Production per Lactating Cow |
|-------------------------------------|--------------------------|-------------|------------------------------------|
|                                     | Baseline                 | Midterm     | Matched Midterm Farmers            |
| All farmers                         | 7.61 liters              | 7.07 liters | 9.44 liters                        |
| <b>Gender</b>                       |                          |             |                                    |
| Female                              | 5.86 liters              | 7.85 liters | 8.00 liters                        |
| Male                                | 7.66 liters              | 6.63 liters | 10.31 liters                       |
| <b>Farm Scale<sup>2</sup></b>       |                          |             |                                    |
| Small                               | 7.91 liters              | 7.19 liters | 9.72 liters                        |
| Medium                              | 4.98 liters              | 6.72 liters | 7.67 liters                        |
| Large <sup>3</sup>                  | 7.56 liters              | 2.31 liters | 3.36 liters                        |
| N                                   | 140                      | 64          | 65                                 |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> If dry production per cow or dry production per lactating cow was less than one liter, we assumed that the farmer misinterpreted the question and reported per cow production as opposed to production for all cows.

<sup>2</sup> Gender is defined as the gender of the respondent at baseline, and if the respondent self-identified as the head of the household at baseline.

<sup>3</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

**Exhibit 54. Daily Milk Production per Cow, Rainy and Dry Seasons Season for New Midterm Sample (in Liters)**

| Farmer Characteristics <sup>1</sup> | Rainy Season             |                                    | Dry Season               |                                    |
|-------------------------------------|--------------------------|------------------------------------|--------------------------|------------------------------------|
|                                     | Dairy Production per Cow | Dairy Production per Lactating Cow | Dairy Production per Cow | Dairy Production per Lactating Cow |
| All farmers                         | 6.95 liters              | 7.58 liters                        | 5.05 liters              | 7.69 liters                        |
| <b>Gender<sup>2</sup></b>           |                          |                                    |                          |                                    |
| Female                              | 5.75 liters              | 5.75 liters                        | 4.40 liters              | 5.83 liters                        |
| Male                                | 6.25 liters              | 10.00 liters                       | 5.92 liters              | 12.67 liters                       |
| <b>Farm Scale</b>                   |                          |                                    |                          |                                    |
| Small                               | 6.64 liters              | 7.09 liters                        | 5.31 liters              | 5.88 liters                        |
| Medium                              | 7.63 liters              | 8.92 liters                        | 4.49 liters              | 11.61 liters                       |
| Large <sup>3</sup>                  | N/A                      | N/A                                | N/A                      | N/A                                |
| N                                   | 16                       | 15                                 | 19                       | 19                                 |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows and were new midterm farmers. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> If dry production per cow or dry production per lactating cow was less than one liter, we assumed that the farmer misinterpreted the question and reported per cow production as opposed to production for all cows. If wet production per cow or wet production per lactating cow was less than two liters, we assumed that the farmer misinterpreted the question and reported per cow production as opposed to production for all cows.

<sup>2</sup> Gender is defined as the gender of the respondent at midterm, and if the respondent self-identified as the head of the household at midterm.

<sup>3</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.



There are some minor seasonal differences in daily milk production per cow at midterm. One would expect that milk production in the rainy season to be higher than in the dry season since in the rainy season farmers have access to more water and feed. However, for the matched sample, in general the daily production per cow in the dry season is *marginally* higher than in the rainy season. This is true for both men and women and farmers of all scales. Conversely, for the new midterm sample on the other hand, daily production per cow is *marginally* higher in the rainy season than in the dry season. These seasonal changes, while paradoxical, are not statistically different from each other. Given the large number of missing responses for the production questions, we caution against interpreting these findings conclusively. We will explore these seasonal changes more during the endline evaluation with additional qualitative follow-up.

Next, we discuss potential reasons for a decline in overall dairy production in both the dry and rainy seasons:

- 1) First, in the rainy season, Cyclone Idai resulted in cattle deaths and higher rates of disease that could have led to a decline in dairy production from baseline to midterm. Cooperatives and paravets also said that the practice of zero-grazing makes animals more susceptible to diseases during the rainy season, as the corrals are not as hygienic.
- 2) Second, the qualitative interviews with farmers, cooperative members, and paravets suggest that one key reason for the decrease in milk production is poor animal health and nutrition at midterm compared to baseline, which led to lower yields per cow. “Dairy cattle require a lot of attention and care,” one established farmer said. He said that understanding the proper nutrition and right amount of feed takes a lot of knowledge and that to successfully maximize the full production potential of Jersey cows requires the appropriate inputs, which are costly. The owner of one of the largest farms in the project asked, “How do you expect a farmer who does not have enough to feed his family to feed his cows?”

**When cows are in a better state of health in terms of environment and food, they have less disease and give more milk. We need support to improve the corral and improve the quality of feed and forage. Only then would we increase the production of milk through having a healthy herd.**

-Farmer and paravet
- 3) The last potential reason for the decline in milk production levels is lack of motivation among small-scale dairy farmers due to a decrease in the price paid per liter of milk to them. In Manica, for example, the main buyer of milk in the formal market system lowered the price paid for milk from 23 meticaís/liter to 17 meticaís/liter, a price that is too low for farmers to make money from milk sales. Lower market prices result in lower revenues from sales (see **Section 3.5.3**) and dis-incentivizes small-scale farmers from making investments in cow feed and other milk production enhancing inputs. This low average price of milk is also reflected in **Section 4** where we discuss findings from cooperatives and processors. Many cooperatives in our sample report that farmers, especially smaller-scale ones, engage in side-selling to make dairy farming a more worthwhile enterprise. We also found this in **Section 3.1.5** where income from dairy farming has declined as the primary source of income from baseline to midterm. This lack of motivation is less likely to afflict medium-scale farmers who receive higher revenue from milk sales. Thus, milk production for medium-scale farmers increased marginally in both seasons.

### **Milk Production Yesterday**

The midterm survey asked farmers to report their per-cow milk production “yesterday” (the day before the survey) to examine consistency with responses to the seasonal milk production questions. Since these questions were not asked at baseline we cannot make any comparisons between baseline and midterm. **Exhibit 55** and **Exhibit 56** report the findings for the matched farmers at midterm and the new midterm farmers respectively. On average, matched sample farmers reported a yield of 5.28 liters per cow on the previous day while new midterm farmers reported 5.46 liters per cow on the previous day. As expected, the values for milk production per lactating cow are higher than the milk production per cow values. With respect to gender, we find that in the matched sample, women are consistently more productive. Women produced on average 6.93 liters per cow on the previous day and 7.22 per lactating cow on the previous day compared to 5.44 liters per cow and 6.40 liters per lactating for men. However, in the new midterm sample, men appear to be more productive. However, the sample sizes for the new midterm sample are very small for definitive conclusions to be drawn.

**Exhibit 55. Milk Production per Cow, Yesterday (in Liters) for Matched Sample**

| Farmer Characteristic | Milk Production per Cow | Milk Production per Lactating Cow |
|-----------------------|-------------------------|-----------------------------------|
| All farmers           | 5.28 liters             | 6.30 liters                       |
| <b>Gender</b>         |                         |                                   |
| Female                | 6.93 liters             | 7.22 liters                       |
| Male                  | 5.44 liters             | 6.40 liters                       |
| <b>Farm Scale</b>     |                         |                                   |
| Small                 | 5.48 liters             | 6.33 liters                       |
| Medium                | 4.54 liters             | 6.28 liters                       |
| Large                 | 1.38 liters             | 4.40 liters                       |
| N                     | 81                      | 84                                |

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Sample includes only midterm farmers who were matched to baseline. Farm scale is defined as the baseline level.*

<sup>2</sup> Gender is defined as the gender of the respondent at baseline, and if the respondent self-identified as the head of the household at baseline

**Exhibit 56. Milk Production per Cow, Yesterday (in Liters) for New Midterm Sample**

| Farmer Characteristic | Milk Production per Cow | Milk Production per Lactating Cow |
|-----------------------|-------------------------|-----------------------------------|
| All farmers           | 5.46 liters             | 5.84 liters                       |
| <b>Gender</b>         |                         |                                   |
| Female                | 4.38 liters             | 5.21 liters                       |
| Male                  | 6.26 liters             | 6.39 liters                       |
| <b>Farm Scale</b>     |                         |                                   |
| Small                 | 5.35 liters             | 5.53 liters                       |
| Medium                | 5.70 liters             | 6.63 liters                       |
| Large                 | N/A                     | N/A                               |
| N                     | 24                      | 25                                |

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Sample includes only midterm farmers who were not matched to baseline. Farm scale is defined as the midterm level.*

<sup>2</sup> Gender is defined at midterm and if the respondent self-identified as the head of the household at midterm.

### 3.5.2 Volume of Sales

#### Rainy Season

**Exhibit 57** reports on volume of daily milk sales by matched farmers and new midterm farmers for the rainy season. We limit the sample to only those who answered milk production questions in order to ensure that the same respondent was answering for both milk production and milk sales in the rainy season. For the matched sample, the daily volume of milk sales in the rainy season declined from 7.94 liters at baseline to 7.09 liters at midterm, but this reduction was not statistically significant. There was no significant change in the volume of daily sales for any category of farmers from baseline to midterm. The values for new midterm farmers are less reliable because of a very small sample size. It is important to note that volume of sales are reported as *daily values for all cows* and thus will not match up to milk production values reported in **Section 3.5.1**, which report *daily values per cow*.

#### Dry Season

As in the rainy season, we limit the sample to only those who answered milk production questions in order to ensure that the same respondent was answering for both milk production and milk sales in the dry season. The average daily sales volume for the matched farmers for dry season shows a decline from baseline to midterm (**Exhibit 58**), but the change is not statistically significant. At midterm farmers sold 6.92 liters per day, compared to 9.12 liters per cow at midterm. The volume of daily sales for matched female farmers increased from 5.35 liters per cow to 9.40 liters per cow, while the volume for matched male farmers reduced from 7.26 liters to 6.03 liters from baseline and midterm. The volume of daily sales for small-scale farmers increased, but the increase was not significant, while the volume for medium-scale farmers decreased significantly, between baseline and midterm.

**Exhibit 57. Volume of Milk Sales, Rainy Season (in Liters per Day)**

| Farmer Characteristic     | Baseline     | Midterm      | New Midterm Farmers |
|---------------------------|--------------|--------------|---------------------|
| All farmers               | 7.94 liters  | 7.09 liters  | 13.84 liters        |
| <b>Gender<sup>1</sup></b> |              |              |                     |
| Female                    | 5.67 liters  | 8.88 liters  | 5.00 liters         |
| Male                      | 5.98 liters  | 8.19 liters  | 7.33 liters         |
| <b>Farm Scale</b>         |              |              |                     |
| Small                     | 5.74 liters  | 6.12 liters  | 5.60 liters         |
| Medium                    | 20.79 liters | 16.33 liters | 30.33 liters        |
| Large                     | 100 liters   | N/A          | N/A                 |
| N                         | 139          | 57           | 15                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses. We further restrict the sample size for both baseline and midterm by only those who responded to the respective milk production volume question.*

<sup>1</sup> Gender is defined as the gender of the respondent at baseline, and if the respondent self-identified as the head of the household at baseline

**Exhibit 58. Volume of Milk Sales, Dry Season (in Liters per Day)**

| Farmer Characteristic     | Baseline     | Midterm                    | New Midterm Farmers |
|---------------------------|--------------|----------------------------|---------------------|
| All farmers               | 9.12 liters  | 6.92 liters                | 7.62 liters         |
| <b>Gender<sup>1</sup></b> |              |                            |                     |
| Female                    | 5.35 liters  | 9.40 liters                | 4.00 liters         |
| Male                      | 7.26 liters  | 6.03 liters                | 8.24 liters         |
| <b>Farm Scale</b>         |              |                            |                     |
| Small                     | 5.55 liters  | 7.36 liters                | 4.75 liters         |
| Medium                    | 37.50 liters | 4.00 liters * <sup>3</sup> | 14.50 liters        |
| Large <sup>2</sup>        | 60.00 liters | N/A                        | N/A                 |
| N                         | 138          | 63                         | 17                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses. We further restrict the sample size for both baseline and midterm by only those who responded to the respective milk production volume question.*

<sup>1</sup> Gender is defined as the gender of the respondent at baseline, and if the respondent self-identified as the head of the household at baseline

<sup>2</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

<sup>3</sup> Only eight medium-scale farmers responded to this question.

### **Volume of Milk Sales on the Previous Day**

**Exhibit 59** presents the volume of daily milk sales on the day before the midterm survey. On average, a matched dairy farmer sold 12.20 liters of milk per day before the survey, while new midterm farmers sold 11.79 liters. While the matched male farmers sold an average of 14.54 liters per day, matched female farmers sold only 9.50 liters on average. This implies that women sold a smaller share of their milk production from yesterday than men in the matched sample. We excluded the one large farmer who owned close to 250 dairy cattle from the analysis to avoid skewing the results. The volume of milk sold by that farmer on the day prior to midterm data collection was 2,319 liters.

**Exhibit 59. Volume of Milk Sales, Yesterday (in Liters per Day)**

| Farmer Characteristic | Volume of Milk Sales for Matched Sample <sup>1</sup> | Volume of Milk Sales for New Midterm Sample <sup>2</sup> |
|-----------------------|------------------------------------------------------|----------------------------------------------------------|
| All farmers           | 12.20 liters                                         | 11.79 liters                                             |
| <b>Gender</b>         |                                                      |                                                          |
| Female                | 9.50 liters                                          | 6.25 liters                                              |
| Male                  | 14.54 liters                                         | 7.28 liters                                              |
| <b>Farm Scale</b>     |                                                      |                                                          |
| Small                 | 9.57 liters                                          | 4.35 liters                                              |
| Medium                | 28.58 liters                                         | 29.85 liters                                             |
| Large                 | N/A                                                  | N/A                                                      |
| N                     | 83                                                   | 24                                                       |

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Sample includes all midterm farmers regardless of whether they were matched to baseline or not. We further restrict the sample size for both baseline and midterm by only those who responded to the respective milk production volume question. Farm scale as defined at midterm level.*

<sup>1</sup> Gender and farm scale are defined at baseline, and if the respondent self-identified as the head of the household at baseline

<sup>2</sup> Gender and farm scale are defined at midterm, and if the respondent self-identified as the head of the household at midterm

### 3.5.3 Value of Sales

This section presents daily sales values for both seasons at midterm. We present results in US dollars (USD) to be consistent with baseline and use the conversion value of 1 USD to 70 Mozambican metical for all calculations.<sup>49</sup>

#### Rainy Season

On average, a matched dairy farmer in the rainy season daily sold milk worth USD 2.92 at baseline and USD 2.19 at midterm (**Exhibit 60**), but the decrease is not statistically significant. A loss in the value of daily milk sales by small and medium-scale farmers drove the decline. Similar declines in daily value of sales can be seen in all categories of farmers between baseline and midterm, but none of the changes are statistically significant.

**Selling practices, the transparency model, and market linkages have improved, but there is a lot of injustice for the low price [our processor] pays. It is not satisfactory. We want a better price and this is demotivating the farmers.**

-Farmer

#### Dry Season

In the dry season, the value of milk sales was higher than in the rainy season. This finding is unsurprising, as the volume of sales, as discussed in **Section 3.5.2**, was also higher in the dry season. On average a matched farmer sold milk daily worth USD 3.25 at baseline and only USD 2.25 at midterm (**Exhibit 61**), but the difference is not statistically significant. Matched medium-scale farmers reported a significant decline in the value of milk sold between baseline and midterm, but the small number of matched midterm farmers responding to this question could be driving this finding. It is important to note that only about half of matched farmers and of new midterm farmers responded to the questions about sales values; therefore, the results may not be fully representative of the project farmer population at midterm.

**Exhibit 60. Daily Value of Milk Sales, Rainy Season (in USD)**

| Farmer Characteristic     | Baseline | Midterm | New Midterm Farmers |
|---------------------------|----------|---------|---------------------|
| All farmers               | \$2.92   | \$2.19  | \$4.87              |
| <b>Gender<sup>1</sup></b> |          |         |                     |
| Female                    | \$1.50   | \$2.85  | \$1.57              |
| Male                      | \$1.70   | \$2.54  | \$2.49              |
| <b>Farm Scale</b>         |          |         |                     |
| Small                     | \$1.94   | \$1.88  | \$1.85              |
| Medium                    | \$9.02   | \$5.15  | \$10.90             |
| Large <sup>2</sup>        | \$36.86  | N/A     | N/A                 |
| N                         | 122      | 57      | 15                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-response. We further restrict the sample size for both baseline and midterm by only those who responded to the respective milk production volume question.

<sup>1</sup> Gender is defined as the gender of the respondent at baseline, and if the respondent self-identified as the head of the household at baseline.

<sup>2</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

1 USD = 70 metical.

<sup>49</sup> MERCADO Baseline Evaluation Report. IMPAQ International. 2017.

**Exhibit 61. Daily Value of Milk Sales, Dry Season (in USD)**

| Farmer Characteristic     | Baseline | Midterm | New Midterm Farmers |
|---------------------------|----------|---------|---------------------|
| All farmers               | \$3.25   | \$2.25  | \$2.43              |
| <b>Gender<sup>1</sup></b> |          |         |                     |
| Female                    | \$1.53   | \$3.21  | \$1.17              |
| Male                      | \$1.99   | \$1.92  | \$2.49              |
| <b>Farm Scale</b>         |          |         |                     |
| Small                     | \$1.87   | \$2.38  | \$1.41              |
| Medium                    | \$14.49  | \$1.35  | \$4.88              |
| Large <sup>2</sup>        | \$18.86  | N/A     | N/A                 |
| N                         | 122      | 63      | 17                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-response. We further restrict the sample size for both baseline and midterm by only those who responded to the respective milk production volume question.*

<sup>1</sup> Gender is defined as the gender of the respondent at baseline, and if the respondent self-identified as the head of the household at baseline

<sup>2</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

1 USD = 70 metical.

### **Value of Milk Sales Yesterday**

On average, matched dairy farmers sold milk worth USD 3.84 on the day before they responded to the midterm survey, while new midterm farmers sold USD 4.00 worth (**Exhibit 62**). Matched male farmers on average sold milk worth USD 4.73, while matched female farmers sold milk worth only USD 2.95 on the previous day. Matched small-scale farmers, who form the majority of the respondents, sold milk worth USD 3.04 on the previous day, while matched medium-scale farmers sold milk worth over four times more, at USD 8.84. As both more matched and new midterm farmers responded to this question than to questions about season-wide sales, these results are more likely to represent the project farmer population. The value of milk sold by the outlier large farmer with more than 250 cows on the day prior to midterm data collection was USD 531; we excluded this farmer from the data analysis.

**Exhibit 62. Midterm Daily Value of Milk Sales, Yesterday (in USD)**

| Farmer Characteristic | Value of Milk Sales for Matched Sample <sup>1</sup> | Value of Milk Sales for New Midterm Sample <sup>2</sup> |
|-----------------------|-----------------------------------------------------|---------------------------------------------------------|
| All farmers           | \$3.84                                              | \$4.00                                                  |
| <b>Gender</b>         |                                                     |                                                         |
| Female                | \$2.95                                              | \$1.97                                                  |
| Male                  | \$4.73                                              | \$2.23                                                  |
| <b>Farm Scale</b>     |                                                     |                                                         |
| Small                 | \$3.04                                              | \$1.36                                                  |
| Medium                | \$8.84                                              | \$10.41                                                 |
| Large                 | N/A                                                 | N/A                                                     |
| N                     | 83                                                  | 24                                                      |

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. We further restrict the sample size for both baseline and midterm by only those who responded to the respective milk production volume question. Farm scale as defined at midterm level.*

<sup>1</sup> Gender and farm scale are defined at baseline, and if the respondent self-identified as the head of the household at baseline

<sup>2</sup> Gender and farm scale are defined at midterm, and if the respondent self-identified as the head of the household at midterm

1 USD = 70 metical.

### 3.5.4 Milk Utilization

This section presents results for milk utilization as percentages of milk production for both rainy and dry seasons.

#### ***Rainy Season***

In the rainy season, matched small-scale farmers reported at baseline that they retained milk for calf consumption, on average, 19 percent of the milk they produced; this number went down significantly to 210 percent at midterm (**Exhibit 63**). This group of farmers increased the percentage of their milk sold to cooperatives from 58 percent at baseline to 85 percent at midterm. We did not observe any other significant changes in milk utilization in rainy season between baseline and midterm.

#### ***Dry Season***

As in the rainy season, the percentage of milk retained for calf consumption by matched small-scale farmers in the dry season declined significantly between baseline and midterm (

**2** *Question not asked at baseline.*

Exhibit 64). Similar to the rainy season, the share of milk sold to cooperatives increased significantly from 54 percent at baseline to 87 percent at midterm. At baseline, on average small farmers sold only 7 percent of their milk locally, but by midterm this proportion significantly increased to 14 percent. We did not observe any other significant changes in milk utilization in the dry season between baseline and midterm. It is important to note that milk utilization as a percentage of milk production may add up to more or less than 100 percent because of discrepancies in the utilization reported by farmers and their total production. For both matched farmers and new midterm farmers, the response rate for both versions of this question was less than half. Therefore, the results may not be fully representative of the project farmer population.



**Exhibit 63. Milk Utilization as Percentage of Milk Production, Rainy Season**

| Utilization of Milk             | Small    |           | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|---------------------------------|----------|-----------|----------|---------|--------------------|---------|---------------------|
|                                 | Baseline | Midterm   | Baseline | Midterm | Baseline           | Midterm |                     |
| Retained for consumption        | 18.00%   | 14.72%    | 5.54%    | 6.85%   | 0%                 | 0%      | 9.53%               |
| Milk lost                       | 0.87%    | 0%        | 0%       | 0%      | 0%                 | N/A     | 0%                  |
| Retained for calves             | 19.09%   | 10.43%*** | 11.72%   | 10.14%  | 0.31%              | N/A     | 10.14%              |
| Sold to cooperatives            | 57.11%   | 85.05%**  | 52.36%   | 47.01%  | 4.62%              | N/A     | 48.47%              |
| Sold to processors <sup>2</sup> | N/A      | 2.85%     | N/A      | 0%      | N/A                | N/A     | 20.64%              |
| Sold locally                    | 8.06%    | 4.23%     | 0.46%    | 0%      | 2.3%               | N/A     | 7.81%               |
| Sold to other buyers            | 0.26%    | 0%        | 16%      | 0%      | 0.77%              | 0%      | 0%                  |
| N                               | 109      | 46        | 12       | 5       | 1                  | 1       | 14                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-response.

<sup>1</sup> When there were zero responses to a question, we report N/A.

<sup>2</sup> Question not asked at baseline.

**Exhibit 64. Milk Utilization as a Percentage of Total Milk Production, Dry Season**

| Utilization of Milk             | Small    |          | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|---------------------------------|----------|----------|----------|---------|--------------------|---------|---------------------|
|                                 | Baseline | Midterm  | Baseline | Midterm | Baseline           | Midterm |                     |
| Retained for consumption        | 16.94%   | 20.46%   | 6.14%    | 10.33%  | 0%                 | 0%      | 59.54%              |
| Milk lost                       | 1.82%    | 1.46%    | 0%       | 0%      | 0%                 | N/A     | 6.54%               |
| Retained for calves             | 22.26%   | 9.17%*** | 15.11%   | 14.17%  | 0.18%              | N/A     | 20.31%              |
| Sold to cooperatives            | 54.47%   | 86.76%** | 60.48%   | 49.33%  | 3.64%              | N/A     | 48.74%              |
| Sold to processors <sup>2</sup> | N/A      | 0.39%    | N/A      | 0%      | N/A                | N/A     | 12.73%              |
| Sold locally                    | 6.84%    | 13.76%** | 9.91%    | 0%      | 0.91%              | N/A     | 7.82%               |
| Sold to other buyers            | 1.39%    | 3.57%    | 3.36%    | 0%      | 0.91%              | 0%      | 0%                  |
| N                               | 109      | 57       | 12       | 6       | 1                  | 1       | 18                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.

<sup>1</sup> When there were zero responses to a question, we report N/A.

<sup>2</sup> Question not asked at baseline.

### 3.5.5 Milk Quality

The farmer survey asked about the frequency of milk rejection and the main reasons for rejection. On average, matched small farmers reported their milk was rejected 4.69 times a year at baseline, and that number significantly declined to 2.31 times a year at midterm (**Exhibit 65**). For medium-scale farmers, the number of times milk was rejected in a year also dropped between baseline and midterm. Further, the new midterm farmers faced, on average, only 1.92 rejections per year. Among those who reported milk rejection, the primary reason was mastitis for both survey rounds and among all categories of farmers. From baseline to midterm, mastitis and boiled milk increased as the primary reason for rejection; the difference is significant at the 10 percent level for small farmers for boiled milk.

**Exhibit 65. Milk Rejection**

| Variable                           | Small    |         | Medium   |         | Large <sup>1</sup> |         | New Midterm Farmers |
|------------------------------------|----------|---------|----------|---------|--------------------|---------|---------------------|
|                                    | Baseline | Midterm | Baseline | Midterm | Baseline           | Midterm |                     |
| Had milk rejected in the past year | 45.16%   | 47.11%  | 46.15%   | 66.66%  | 100%               | 0%      | 39.02%              |
| N                                  | 124      | 121     | 13       | 12      | 1                  | 1       | 41                  |
| <b>If Rejected, Frequency</b>      |          |         |          |         |                    |         |                     |
| Number of times milk was rejected  | 4.69     | 2.31*** | 8.67     | 2       | 1                  | N/A     | 1.92                |
| N                                  | 56       | 48      | 6        | 7       | 1                  | 0       | 13                  |
| <b>If Rejected, Reason</b>         |          |         |          |         |                    |         |                     |
| Mastitis                           | 80.36%   | 87.72%  | 57.14%   | 75%     | 100%               | N/A     | 81.25%              |
| Boiled milk                        | 3.57%    | 12.5%*  | 0%       | 12.5%   | 0%                 | N/A     | 0%                  |
| Water added to milk <sup>2</sup>   | N/A      | 21.43%  | N/A      | 0%      | N/A                | N/A     | 13.33%              |
| N                                  | 56       | 56      | 7        | 7       | 1                  | 0       | 16                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant. The sample sizes differ between baseline and midterm because of different rates of non-responses.*

<sup>1</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.

<sup>2</sup> Not asked at baseline.

### 3.6 Effects of Cyclone Idai

In March 2019, Cyclone Idai struck Mozambique and had a devastating effect on millions of people in Mozambique. Dairy farmers who rely heavily on the environment for their fodder and other supplies disproportionately faced the brunt of this calamity.<sup>50</sup> Not only was the immediate impact of the cyclone devastating, but also the effect continued due to loss of infrastructure, cattle diseases, and lack of access to clean water, all of which influenced the long-term dairy production of the farmers.<sup>51</sup>

This section examines the impact of the cyclone on dairy herds, milk production and sales, and dairy farm infrastructure. Except where explicitly mentioned, all midterm farmers who had dairy cows are included, whether we matched them to baseline or not. We asked the questions about Cyclone Idai,

<sup>50</sup> <http://www.fao.org/news/story/en/item/1187475/icode/>

<sup>51</sup> <https://theecologist.org/2019/apr/09/animals-suffer-cyclone-idai-aftermath>

which occurred long after baseline data collection, only at midterm. We define farm scale as the midterm value.

### 3.6.1 Impact on Herds

Herd losses due to Cyclone Idai include cattle lost directly in the cyclone as well as losses that happened because of cattle illnesses after the cyclone.

**Exhibit 66** explores the extent of cattle loss due to Cyclone Idai. It reports cattle only as absolute numbers, not as proportions of total cattle owned. This is because we collected our measure of total cattle owned post-Cyclone Idai. Thus, reporting on *proportion of cattle* lost is not meaningful because the Cyclone itself affects total herd size.

Around 11 percent of small-scale farmers in the midterm sample lost cattle due to the cyclone. The average number of cattle lost by small farmers was 1.88. This number is quite significant given that small farmers have herds of one to three cows. Further, around 15 percent of small farmers reported that their cattle succumbed to diseases because of the cyclone. The average number of cattle lost after the cyclone was 1.65.

Around 39 percent of medium-scale farmers in the midterm sample lost cattle due to Idai. The average number of cattle lost was three. Given that medium-scale farmers are defined as having between four and 19 cows, the loss of three cattle may be less significant than the loss suffered by small farmers, but would still have an impact on their farm operation. Around 57 percent of medium-scale farmers had cattle succumb to some illness after Idai.

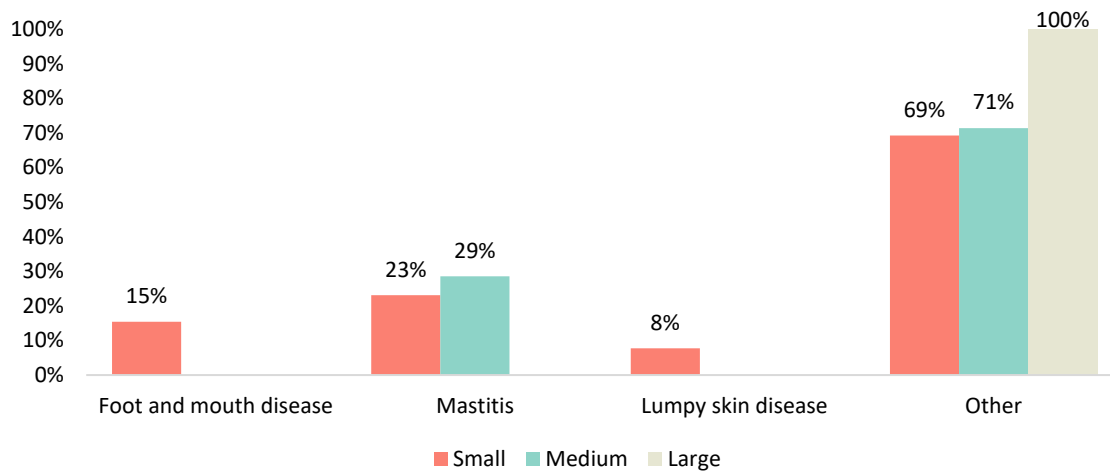
**Exhibit 67** presents farmers' reports of the types of disease caused by the cyclone. Of the small-scale farmers who reported cattle sickness due to the cyclone, 15 percent reported that their cattle suffered from foot and mouth disease, 23 percent reported mastitis, 8 percent reported lumpy skin disease, and 69 percent reported other diseases. Of the medium-scale farmers who reported cattle sickness due to the cyclone, 29 percent reported that their cattle suffered from mastitis and 71 percent reported other diseases. Anecdotally, qualitative respondents said that other diseases included tuberculosis and malnutrition. The one large-scale farmer remaining in our sample did not lose any cattle in the cyclone but did have 14 cattle succumb to disease after Idai.

**Exhibit 66. Cattle Lost due to Cyclone Idai**

| Cattle Loss                                             | Small       | Medium      | Large |
|---------------------------------------------------------|-------------|-------------|-------|
| Lost any cattle in Cyclone Idai                         | 10.90%      | 39.13%      | 0%    |
| Average number of cattle lost in Cyclone Idai           | 1.88 cattle | 3.00 cattle | N/A   |
| Lost cattle due to later illness caused by Cyclone Idai | 14.74%      | 57.14%      | 100%  |
| Average number of cattle lost after Cyclone Idai        | 1.65        | 2.67        | 14    |
| N                                                       | 156         | 24          | 1     |

*Note: N includes all midterm farmers who identified at the time of the survey that they currently owned dairy cows, regardless of whether they were matched to baseline or not. The largest farm, with over 250 cows, is excluded because it is an extreme outlier. Farm scale is defined as the midterm level.*

**Exhibit 67. Types of Illnesses After Cyclone Idai**



*Note: The sample includes all midterm farmers who identified at the time of the survey that they currently owned cows, regardless of whether they were matched to baseline or not. The largest farm, with over 250 cows, is excluded because it is an extreme outlier. Farm scale is defined as the midterm level.*

*N = Small (13); Medium (7); Large (1)*

### 3.6.2 Impact on Milk Production and Sales

Cyclone Idai caused a reduction in production of milk. **Exhibit 68** shows that almost a third of small-scale farmers, two-thirds of medium-scale farmers, and the one large farmer reported a decline in milk production as result of the cyclone. Among those who reported a decline, the average decline was 3.93 liters per cow per day for small-scale farmers and 10.08 liters for medium-scale farmers. Almost half of small-scale farmers and one-sixth of medium-scale farmers reported no change in their milk production due to Cyclone Idai. A miniscule percentage of small-scale farmers increased their production, by an average of 5.25 liters per day per cow; 13 percent of medium-scale farmers reported increased milk production, an average of 18.67 liters per cow per day.

**The surviving animals were stressed, and this was reflected in the production of milk in quantity and quality.**  
-Farmer

As we show in **Exhibit 69** this unexpected increase in production because of the cyclone may be partially explained by the higher prices farmers received for their milk. As a result of the cyclone, about 17 percent of the medium-scale farmers saw an increase in the price of milk sold, with an average increase USD 0.11 (8 meticaís). Only about 5 percent of the small-scale farmers reported higher prices due to the cyclone; 83 percent reported no change and 11 percent reported a decline in prices because of the cyclone.

**Exhibit 68. Impact on Milk Production due to Cyclone Idai**

| Milk Production                                 | Small       | Medium       | Large |
|-------------------------------------------------|-------------|--------------|-------|
| Milk production increased                       | 2.55%       | 12.50%       | 0%    |
| Increase in liters per day per cow <sup>1</sup> | 5.25 liters | 18.67 liters | 0     |
| Milk production decreased                       | 29.30%      | 62.50%       | 100%  |
| Decrease in liters per day per cow <sup>1</sup> | 3.93 liters | 10.08 liters | NA    |
| Milk production stayed the same                 | 49.04%      | 16.67%       | 0%    |
| N                                               | 157         | 24           | 1     |

*Note: The sample includes all farmers who identified at the time of the survey that they currently owned cows, regardless of whether they were matched to baseline or not. The largest farm, with over 250 cows, is excluded because it is an extreme outlier. Farm scale is defined as the midterm level. Many farmers reported, “don’t know” and hence responses will not add up to 100%.*

<sup>1</sup>As reported by farmers who said that their production increased or decreased.

**Exhibit 69. Impact on Prices of Milk Sales due to Cyclone Idai**

| Price Difference After Cyclone Idai | Small  | Medium | Large |
|-------------------------------------|--------|--------|-------|
| Average price is lower              | 10.83% | 12.50% | 0%    |
| Decrease in price/liter             | \$0.21 | \$0.3  | 0     |
| Average price is higher             | 5.10%  | 16.67% | 0%    |
| Increase in price/liter             | \$0.15 | \$0.11 | 0     |
| Same/no effect                      | 84.08% | 70.83% | 100%  |
| N                                   | 157    | 24     | 1     |

*Note: The sample includes all farmers who identified at the time of the survey that they currently owned cows, regardless of whether they were matched to baseline or not. The largest farm, with over 250 cows, is excluded because it is an extreme outlier. Farm scale is defined as the midterm level. Many farmers reported, “don’t know” and hence responses will not add up to 100%.*

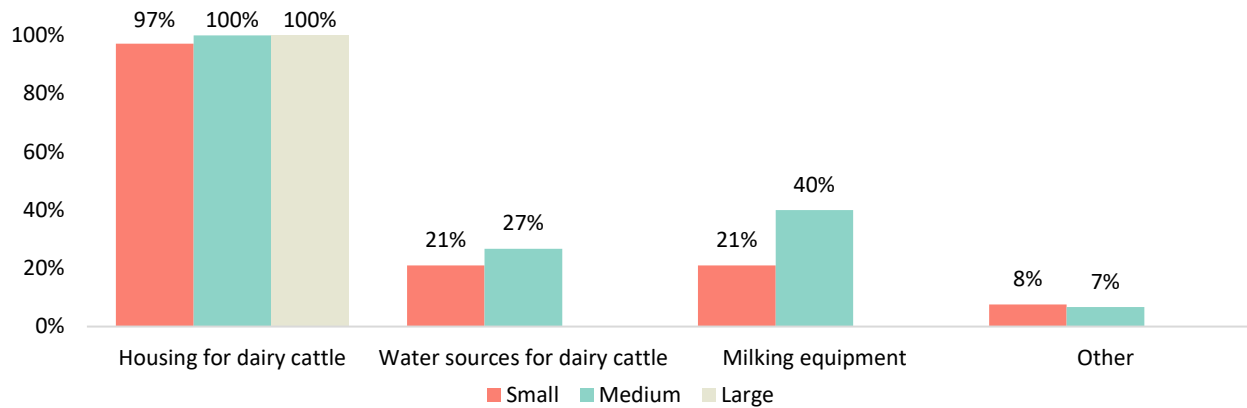
1 USD= 70 meticaís

### 3.6.3 Impact on Dairy Farm Infrastructure and Inputs

As might be expected, the dairy infrastructure that was most affected by the cyclone was housing for the cattle. 97 percent of small-scale farmers, 100 percent of medium-scale farmers, and the lone large-scale farmer reported damage to cattle housing (**Exhibit 70**). Around 21 percent of small-scale and 27 percent of medium-scale farmers also reported damage to water sources for dairy cattle. A little over one-fifth of the small-scale farmers and two-fifths of medium-scale farmers reported damage to milking equipment due to Cyclone Idai.

Beyond the damage, the cyclone also caused problems in accessibility to inputs for a variety of reasons, including damaged public infrastructure and local markets. As shown in **Exhibit 71**, a little under half of the small-scale farmers reported difficulty in accessing inputs because of the cyclone, and 42 percent reported no change. A little over one-third of the medium-scale farmers reported difficulty in accessing inputs because of the cyclone, while almost half reported no change. A very small proportion of small-scale farmers and 9 percent of medium-scale farmers reported that access to inputs was easier after the cyclone. The lone large-scale farmer reported no change.

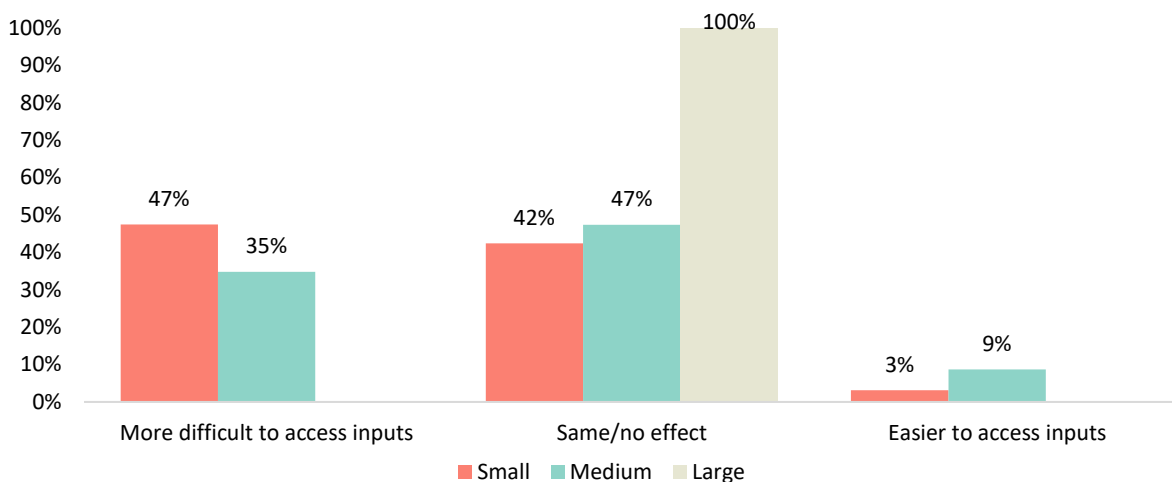
**Exhibit 70. Impact on Dairy Infrastructure due to Cyclone Idai**



*Note: The sample includes all farmers who identified at the time of the survey that they currently owned cows, regardless of whether they were matched to baseline or not. The largest farm, with over 250 cows, is excluded because it is an extreme outlier. Farm scale is defined as the midterm level. Multiple responses were allowed, so responses add up to more than 100%.*

*N = Small (105); Medium (15); Large (1)*

**Exhibit 71. Impact on Dairy Inputs due to Cyclone Idai**



*Note: The sample includes all farmers who identified at the time of the survey that they currently owned cows, regardless of whether they were matched to baseline or not. The largest farm, with over 250 cows, is excluded because it is an extreme outlier. Farm scale is defined as the midterm level.*

*N = Small (157); Medium (24); Large (1)*

### 3.7 Labor Use

Examination of survey responses about labor use among project beneficiaries focuses on full-time and part-time labor hired by the matched sample and new midterm farmers.

For the matched sample, at baseline, small farmers reported hiring an average of 0.60 male full-time employees and 0.20 female full-time employees in the last 12 months. Medium-scale farmers hired four full-time male employees and 0.57 female employees at baseline (**Exhibit 72**). At midterm, the average number of male full-time employees did not change much, but the average number of female full-time

employees declined sharply for both small and medium-scale farmers. New midterm farmers reported hiring 0.9 male full-time employees and 0.18 female full-time employees on average. Most of the workers hired by the farmers in our sample were full-time and permanent. As can be seen below, medium- and large-scale farmers hiring workers to help them with their relatively larger-scale operations drove the numbers.

**Exhibit 72. Types of Labor Farmers Hired, by Labor Type and Gender**

| Worker Gender       | Small    |         | Medium   |         | Large    |         | New Midterm Farmers |
|---------------------|----------|---------|----------|---------|----------|---------|---------------------|
|                     | Baseline | Midterm | Baseline | Midterm | Baseline | Midterm |                     |
| Full-time permanent |          |         |          |         |          |         |                     |
| Male                | 0.60     | 0.71    | 4.00     | 3.79    | 4.00     | 0       | 0.90                |
| Female              | 0.20     | 0.03    | 0.57     | 0.14    | 0        | 0       | 0.18                |
| Full-time seasonal  |          |         |          |         |          |         |                     |
| Male                | 0.05     | 0.10    | 0.50     | 0.62    | 0        | 0       | 0.05                |
| Female              | 0.01     | 0.02    | 0.21     | 0       | 0        | 0       | 0.08                |
| Part-time permanent |          |         |          |         |          |         |                     |
| Male                | 0.02     | 0.14*   | 0        | 0.14    | 0        | 0       | 0                   |
| Female              | 0        | 0.08    | 0.07     | 0       | 0        | 0       | 0                   |
| Part-time seasonal  |          |         |          |         |          |         |                     |
| Male                | 0.06     | 0.12    | 0.07     | 0.14    | 0        | 0       | 0.15                |
| Female              | 0        | 0.07    | 0.07     | 0       | 0        | 0       | 0.03                |
| N                   | 124      | 121     | 14       | 14      | 1        | 1       | 41                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned cows. Since farm scale is endogenous the MERCADO project affects it, we define farm scale as the baseline level of farm scale and keep that constant.*



## SECTION 4. FINDINGS FROM COOPERATIVES, PROCESSORS, AND BREEDERS

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This section presents IMPAQ's main midterm quantitative and qualitative findings from cooperatives, processors and microprocessors, and the breeder. The principal objective was to document the state of these key dairy actors at midterm, examining trainings received, practices, and technologies. For each business, we also collected data on procurement volumes and costs; record keeping; product safety and quality practices; value-added services including storage, processing, and packaging; volume and value of sales; trainings; labor use; and experiences with Cyclone Idai.

We also compare the key performance indicators for these businesses to their baseline levels collected in March 2017. The data on these indicators will be instrumental in helping us measure change across the life of the project. Further, midterm quantitative and qualitative findings garnered key insights into the research questions on impact, effectiveness, and efficiency. Because, as detailed in **Section 2**, the survey instruments changed significantly between baseline and midterm, we provide baseline-to-midterm comparisons only for the key performance indicators and not for other outcomes.<sup>52</sup>

Further, as elaborated in **SECTION 2**, we faced significant issues in eliciting data on costs and revenues from cooperatives and processors. Further, the sample sizes were very small: five cooperatives, eight processors, and one breeder. Because of these sample sizes, all findings in this section should be interpreted with caution. We use *processor* to include both processors and microprocessors, except in instances where we talk explicitly about microprocessors.

We structure the remainder of this section as follows. **Section 4.1** presents an overview of the sample, reporting on regional sample distribution and on respondents' engagement with the Venture37 MERCADO project, trainings received, and record keeping. **Section 4.2** explores procurement, processing, and sales for cooperatives, processors, and breeders with details on procurement volumes and costs, processing volumes for processors, sales volumes and revenues, impact of the MERCADO project on procurement and sales, and experiences with Cyclone Idai. **Section 4.3** examines milk-testing practices by cooperatives and processors. **Section 4.4** details other aspects of dairy businesses including equipment, financing and investments, and labor use. **Section 4.5** presents the future plans for cooperatives, processors, and the breeder. All values reported are for the 12 months from July 1, 2018, to June 30, 2019; we disaggregated by dry and rainy season wherever possible. Dry season is the period from May through October 2018, and rain season is the period from November 2018 through April 2019.

### 4.1 Overview of Sample

#### 4.1.1 Distribution of Sample

**Exhibit 73** shows that we surveyed 14 businesses at midterm out of 15 businesses attempted. For the processors and breeder, in most cases the respondent was the owner or general manager of the business. For cooperatives, the respondent was the president or held another leadership position. One processor was not available for an interview. We surveyed eight processors and five cooperatives. In general, microprocessors are smaller in scale and operation than processors. We surveyed three processors and five microprocessors, so that microprocessors form the larger share of the processor sample. We also surveyed one breeder.<sup>53</sup> **Exhibit 74** presents the distribution of the sample by region.

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<sup>52</sup> See **ANNEX G** for further details.

<sup>53</sup> The breeder included in the sample is a large commercial farm that also conducts breeding activities. This large business has recently acquired a 60% share in one of the large processors in the sample. This business thus was administered three surveys and is included in three samples: farmer, breeder, and processor. Different managers responsible for different areas of the

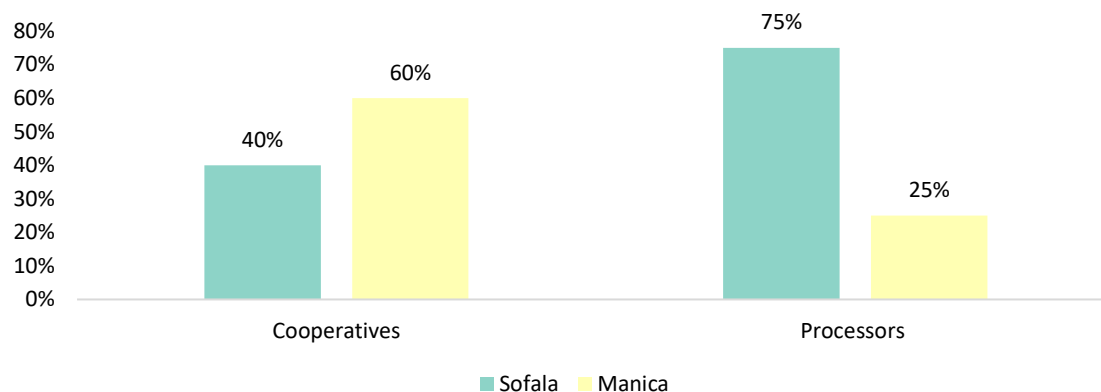
A majority of the processors are located in Sofala, while a majority of the cooperatives are located in Manica. The one breeder in our sample is based in Manica.

Processors in our sample had been in business for varying lengths of time. Entrepreneurs who learned the business and acquired skills from their former employers and from other dairy projects, including previous Venture37 projects, established six processors between 2000 and 2015. One processor established their business in 2008 as a government-backed plant; another processor became established in 2017 as an initiative of an educational institution. The one breeder in our sample was a vertically integrated business that grew from a recently scaled-up farm; the MERCADO project supports this business to supply heifers to the beneficiaries.

**Exhibit 73. Midterm Sample of Cooperatives, Processors, and Breeders**

| Business Type                  | Number Attempted | Number Surveyed | % of Total Surveyed |
|--------------------------------|------------------|-----------------|---------------------|
| Cooperatives                   | 5                | 5               | 35.71%              |
| Processors and microprocessors | 9                | 8               | 57.14%              |
| Breeder                        | 1                | 1               | 7.14%               |
| All businesses                 | 15               | 14              | 100%                |

**Exhibit 74. Midterm Sample of Cooperatives and Processors by Region**



*N = 5 cooperatives, 8 processors*

**Exhibit 75** presents the extent of overlap between the baseline and midterm samples. Three of the five cooperatives who we surveyed at midterm we also surveyed at baseline. The overlap for the processors is lower: Though three of five processors who we surveyed at baseline we re-surveyed at midterm, five new processors who started working with the MERCADO project after the baseline we added to the midterm sample, for a total of eight. Finally, for breeders, we surveyed only one breeder at midterm, while two we surveyed at baseline. Breeders were administered only key informant interviews at baseline. Given that the overlap for cooperatives and processors is not 100 percent, we analyzed the data as a repeated cross-section. Given the very small sample sizes, this will not make any difference in interpretation of the results.

business responded to the surveys. In addition to the farmer survey, we administered a short breeder survey described in Section 2, which included questions specific to their breeding activities. The farming, breeding, and processing operations of this business are separate and hence, we include them in all three samples.

**Exhibit 75. Comparison of Cooperative and Processor Samples Between Baseline and Midterm**

| Business Type                          | Surveyed at Baseline | Surveyed at Midterm | Overlap Between Baseline and Midterm |
|----------------------------------------|----------------------|---------------------|--------------------------------------|
| <b>Cooperatives</b>                    |                      |                     |                                      |
| Cooperative A                          | √                    | √                   | 60%                                  |
| Cooperative B                          |                      | √                   |                                      |
| Cooperative C                          | √                    | √                   |                                      |
| Cooperative D                          |                      | √                   |                                      |
| Cooperative E                          | √                    | √                   |                                      |
| Cooperative F                          | √                    |                     |                                      |
| Cooperative G                          | √                    |                     |                                      |
| <b>Total Cooperative Sample</b>        | <b>5</b>             | <b>5</b>            |                                      |
| <b>Processors and Micro-processors</b> |                      |                     |                                      |
| Processor A (Microprocessor)           |                      | √                   | 37.5%                                |
| Processor B (Microprocessor)           | √                    | √                   |                                      |
| Processor C (Microprocessor)           |                      | √                   |                                      |
| Processor D (Microprocessor)           |                      | √                   |                                      |
| Processor E (Microprocessor)           |                      | √                   |                                      |
| Processor F                            | √                    | √                   |                                      |
| Processor G                            | √                    | √                   |                                      |
| Processor H                            |                      | √                   |                                      |
| Processor I                            | √                    |                     |                                      |
| Processor J                            | √                    |                     |                                      |
| <b>Total Processor Sample</b>          | <b>5</b>             | <b>8</b>            |                                      |
| <b>Breeder</b>                         |                      |                     |                                      |
| Breeder A                              | √                    |                     | 50%                                  |
| Breeder B                              | √                    | √                   |                                      |
| <b>Total Breeder Sample</b>            | <b>2</b>             | <b>1</b>            |                                      |

#### 4.1.2 Engagement with MERCADO

The midterm evaluation revealed that the main motivation of the cooperatives, processors, and breeder for starting their business was the consideration that dairy is a good investment and source of income. Most respondents said they had a positive experience working with MERCADO. Most believed that the project increased the visibility of the actors in the dairy value chain. This visibility motivated many cooperative members and processors. Although most firms increased their output during the MERCADO project, all respondents expressed concerns about their ability to break even and to balance costs and revenues. Respondents stressed the importance of the previous Venture37 projects, could clearly distinguish between those projects and MERCADO, and pointed to the positive impact of MERCADO's investment grants and trainings. However, they highlighted the emerging nature of the dairy value chain in Mozambique and acknowledged that, although support from the MERCADO project has been key, it was insufficient to cover risks in the dairy business, and they require more support in marketing and sales, especially connections to buyers. We describe below the extent of engagement with the MERCADO project with respect to three key activities: training, grants, and record keeping.

##### **Training**

All cooperatives and seven of the eight processors received some training in the last 12 months, as shown in **Exhibit 76**. All five cooperatives received training on milk handling, milk processing, milk storage and cooling, food safety, milk testing, and financial management. The most common type of

training received by processors was milk processing training. Half of the processors had received training on all other topics included in the survey. The most common training provider for both cooperatives and processors was Venture37 (**Exhibit 77**). For processors, other actors who provided trainings included nongovernmental organizations, business development service providers, government agencies, and other private companies. No cooperative received training from government agencies.<sup>54</sup>

There were mixed responses regarding trainings under MERCADO. On the one hand, respondents indicated that MERCADO was key in cooperatives and processors becoming more professional and more sustainable. The cooperatives reported having more members, better infrastructure, more animals, and an increase in sales because of MERCADO training. Processors noted that trainings were beneficial for them and helped them improve in many areas, including milk testing. For instance, many microprocessors participated in tours organized by MERCADO of large processors in Mozambique and South Africa, where they learned to make better yogurt and butter. According to cooperative and processor interviewees, these trainings were crucial in helping to increase milk production and quality.

On the other hand, while MERCADO has conducted trainings on sales and marketing as highlighted in Venture37's semi-annual performance reports, many businesses reported that this was not sufficient. Respondents said that sales had not increased enough to achieve positive net cash flow, so that they were at the same stage as when MERCADO began. They wanted the project to invest more in strengthening the market linkages of industrial and processing units. Most respondents expressed the belief that, although they had received training on seeking suppliers and buyers and on other important management practices, they still had a long way to go before their businesses could be viable. Most respondents reported that improving their market linkages and increasing sales were important motivating factors for joining the MERCADO project; they expressed the hope that they would receive more training on these topics in the second half of the project.<sup>55,56</sup>

**Exhibit 76. Topics of Trainings for Cooperatives and Processors**

| Training Received                              | Cooperatives | Processors | Mean   |
|------------------------------------------------|--------------|------------|--------|
| No training                                    | 0%           | 12.5%      | 7.69%  |
| <b>If Received training, Topic of Training</b> |              |            |        |
| Milk handling                                  | 100%         | 50%        | 69.23% |
| Milk processing                                | N/A          | 62.5%      | 76.92% |
| Milk storage and cooling                       | 100%         | 50%        | 69.23% |
| Food safety training                           | 100%         | 50%        | 69.23% |
| Milk testing training                          | 100%         | 50%        | 69.23% |
| Business operations/financial management       | 100%         | 50%        | 69.23% |

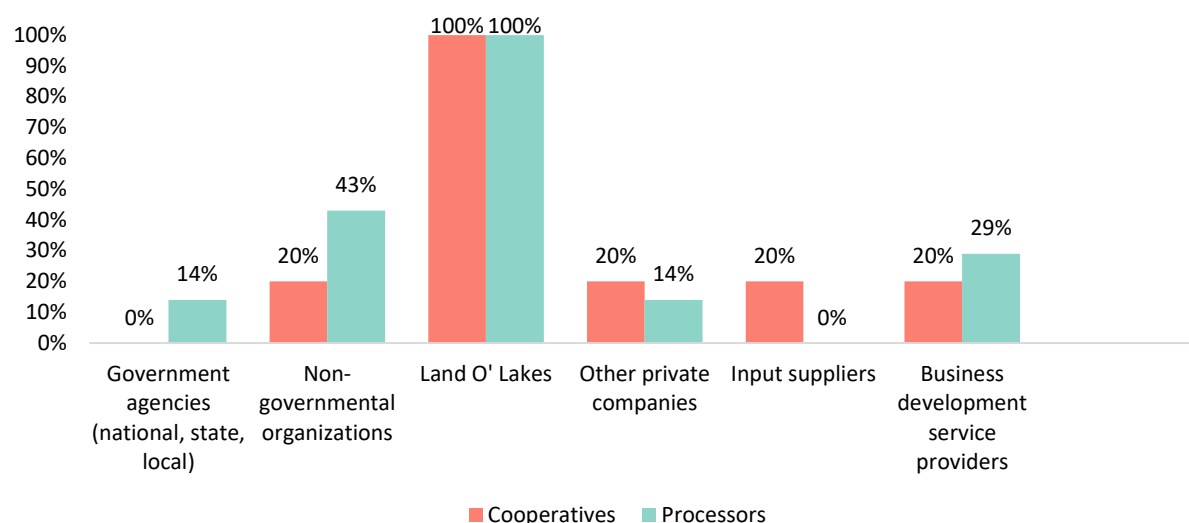
*Note: N = 5 cooperatives, 8 processors. Multiple responses were allowed, so columns add up to more than 100%.*

<sup>54</sup> Apart from MERCADO, processors in our sample also participated in another project from the EU which provided training in milking, collecting, transporting, and testing.

<sup>55</sup> Indicator 40, "Number of cooperatives trained in business and marketing," has a target for year 3 of training only three cooperatives.

<sup>56</sup> Venture37 reports in their semi-annual performance reports that training on marketing and sales have been provided to cooperatives and processors. As reported by cooperatives and processors, these trainings are not sufficient and they would like increased trainings on these topics.

**Exhibit 77. Training Providers for Cooperatives and Processors**



*N = 5 cooperatives, 7 processors. Multiple responses were allowed, so responses add up to more than 100%.*

### **Grants**

Existing and new dairy milk producers, cooperatives and aggregators, input businesses, and service providers used MERCADO DIF grants for co-financing equipment, infrastructure, and other innovations to expand their businesses. The DIF grants for co-financing acquisition of dairy infrastructure and cattle are key motivators for firms to participate in the project. The fact that MERCADO was very active in providing grants explains why the majority of respondents for the 14 surveyed firms said they were or hoped to be beneficiaries of DIF grants.<sup>57</sup> Without these grants, the cooperatives and processors would not have been able to collect the augmented volume of milk received from the farmers. Most respondents said they highly valued these funds and associated their increase in milk volume to engagement with MERCADO.

### **Record Keeping**

At midterm, all businesses said they had kept some kind of record or logs in the last 12 months (**Exhibit 78**). The most common types of records were income and expense ledgers, production ledgers, records of equipment bought, milk collection records, and records of rejection of incoming milk. Processors were less likely than cooperatives to keep records of labor, long-range budgeting, milk sales, and rejections of outgoing milk.

The surveyed firms reported that Venture37 provided training for registration and back-office management, starting with previous projects. They said that MERCADO also provided them with refresher training. Further, a microfinance firm contracted by MERCADO has provided courses in management. Many firms mentioned that the project's requirement that they continually provide data taught them to organize their activities and keep the books up to date. In many firms, student interns were responsible for record keeping.

<sup>57</sup> In our sample, about three firms had received grants from the DIF and all of the others had applied for funds. The most important and immediate need for funds for the sampled firms was to procure transport equipment and milk testing equipment using the DIF funds. All 14 surveyed firms mentioned requiring bicycles, motorbikes, cargo three-wheeler vehicles, or four wheeler vehicles. Given the lack of the response from the formal banking sector, these firms reported relying completely on the DIF grants for purchasing this equipment.

### Exhibit 78. Record Keeping by Cooperatives and Processors

| Records Kept                | Cooperatives | Processors | Mean   |
|-----------------------------|--------------|------------|--------|
| Kept records                | 100%         | 100%       | 100%   |
| N                           | 5            | 8          | -      |
| If Yes, Type of Record      |              |            |        |
| Income and expense          | 100%         | 71.43%     | 83.33% |
| Production                  | 100%         | 100%       | 100%   |
| Labor                       | 100%         | 57.14%     | 75%    |
| Equipment                   | 100%         | 85.71%     | 91.66% |
| Long-range budgeting        | 60%          | 42.86%     | 50%    |
| Rejections of incoming milk | 100%         | 100%       | 100%   |
| Rejections of outgoing milk | 100%         | 57.14%     | 75%    |
| Monthly cash flow           | 100%         | 71.43%     | 83.33% |
| Milk collection             | 100%         | 100%       | 100%   |
| Milk sales                  | 100%         | 57.14%     | 75%    |
| N                           | 5            | 7          | -      |

Note: Multiple responses were allowed, so columns add up to more than 100%.

## 4.2 Procurement, Processing, and Sales

### 4.2.1 Procurement of Raw Milk

This section reports on the procurement of raw milk by cooperatives and processors. After reporting procurement volumes and values, we examine formal agreements with and support services provided to suppliers. Then we examine challenges in milk procurement and the impact MERCADO had on procurement of raw milk. Finally, we explore the impact of Cyclone Idai on raw milk procurement.

#### *Procurement for Cooperatives*

At midterm, the average number of suppliers for cooperatives was 12.2 during the rainy season, while in the dry season the average number of suppliers was marginally higher at 14, as shown in **Exhibit 79**.

On average, the cooperatives procured 17,392 liters of raw milk over the entire rainy season, with a value of USD 5,570 (389,917 meticaís).<sup>58</sup> In the dry season, the average procurement by cooperatives was significantly higher at 26,007 liters, valued at USD 9,520 (666,442 meticaís). The average purchase price per liter for cooperatives was similar in both seasons: approximately USD 0.29 (20 meticaís). While counterintuitive that procurement in the rainy season is lower than in the dry season, three potential explanations exist. They include: (1) total milk production was lower in the rainy season than the dry season (see **Section 3.5.1**), therefore there was less available milk to procure; (2) lack of all-weather roads made it difficult for farmers to deliver the milk; and (3) the farmers spent less time and resources on animal husbandry, particularly feeding and health care. This is an area for the evaluation team to explore in further detail during the endline evaluation.

#### *Procurement for Processors*

Next, we turn to the volume and value of procurement for processors, beginning with a caveat: The findings in **Exhibit 79** do not include the largest processor, which provided procurement volume and value only for the rainy season. Including that processor would skew the numbers for the rainy season,

<sup>58</sup> For consistency, we use the same exchange rate as used in Section 3 i.e. 1 USD = 70 MT

making comparisons difficult. Thus, we report on procurement for the largest processor separately in **Exhibit 80**.

As shown in **Exhibit 79**, processors procured on average 9,500 liters in the rainy season and a little over 10,500 liters of raw milk in the dry season. The average cost of procurement was USD 3,365 (235,563 meticaïs) in the rainy season and USD 3,953 (276,764 meticaïs) in the dry season. The average price per liter of raw milk for processors in both seasons was close to USD 0.35 or 25 meticaïs, which is 20 percent higher than the average price per liter for cooperatives.

**Exhibit 79** documents the volume and value of procurement of the largest processor for the rainy season, the only season for which the respondent reported. This processor's volume of procurement in the rainy season was 368,842 liters of raw milk — more than 30 times the average for the other processors in our sample. The value is also consequently much higher: USD 116,749 (8,172,452 meticaïs). This large processor is a vertically integrated dairy business; at least 95 percent of the procurement, according to the respondent, came from the associated large farm. Although the largest processor did not report procurement and processing data for the dry season for this processor, findings from the rainy season clearly suggest that this processor procured more milk in the rainy season than the average firm. This large firm did not face the same transport difficulties as other firms and had a greater volume and quality of fodder available in the rainy season.

The average number of suppliers for processors was close to four in both rainy and dry seasons (**Exhibit 79**). Smallholder suppliers were the largest source of raw milk for processors in both seasons (**Exhibit 81**). However, in the dry season, the processors relied more on imported powder, while in the rainy season they sourced more than half of their raw milk from cooperatives and other sources.

**Exhibit 79. Volume and Value of Milk Procurement by Cooperatives and Processors**

| Variable                                    | Cooperatives  | Processors <sup>1</sup> | Mean          |
|---------------------------------------------|---------------|-------------------------|---------------|
| <b>Rainy Season</b>                         |               |                         |               |
| Average number of suppliers                 | 12.2          | 4.17                    | 7.82          |
| N                                           | 5             | 6                       | -             |
| Average total volume of procurement         | 17,391 liters | 9,500 liters            | 14,094 liters |
| N                                           | 5             | 2                       | -             |
| Average total value of raw milk procurement | \$5,570       | \$3,365                 | \$4,367       |
| N                                           | 5             | 6                       | -             |
| Average price per liter of raw milk         | \$0.29        | \$0.36                  | \$0.33        |
| N                                           | 5             | 6                       | -             |
| <b>Dry Season</b>                           |               |                         |               |
| Average number of suppliers                 | 14            | 4                       | 9             |
| N                                           | 5             | 5                       | -             |
| Average total volume of procurement         | 26,007 liters | 10,500 liters           | 19,679 liters |
| N                                           | 4             | 2                       | -             |
| Average total value of raw milk procurement | \$9,520       | \$3,953                 | \$6,737       |
| N                                           | 5             | 5                       | -             |
| Average price per liter of raw milk         | \$0.29        | \$0.35                  | \$0.32        |
| N                                           | 5             | 5                       | -             |

Note: N is the number of respondents who reported values for the numbers reported in the row immediately above.

<sup>1</sup>The largest processor was excluded because it provided data only for the rainy season.

1 USD = 70 meticaïs



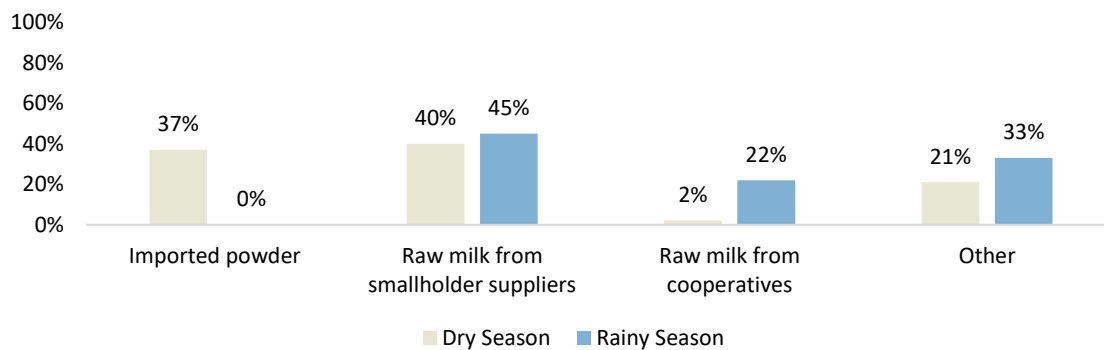
#### Exhibit 80. Volume and Value of Milk Procurement of Largest Processor in Rainy Season

| Variable                                    | Largest Processor |
|---------------------------------------------|-------------------|
| Average total volume of procurement         | 368,842 liters    |
| Average total value of raw milk procurement | \$116,749         |
| Average price per liter of raw milk         | \$0.32            |
| N                                           | 1                 |

Note: N includes only the largest processor.

1 USD = 70 meticaís

#### Exhibit 81. Average Share of Milk Procured from Supplier for Processors, by Season

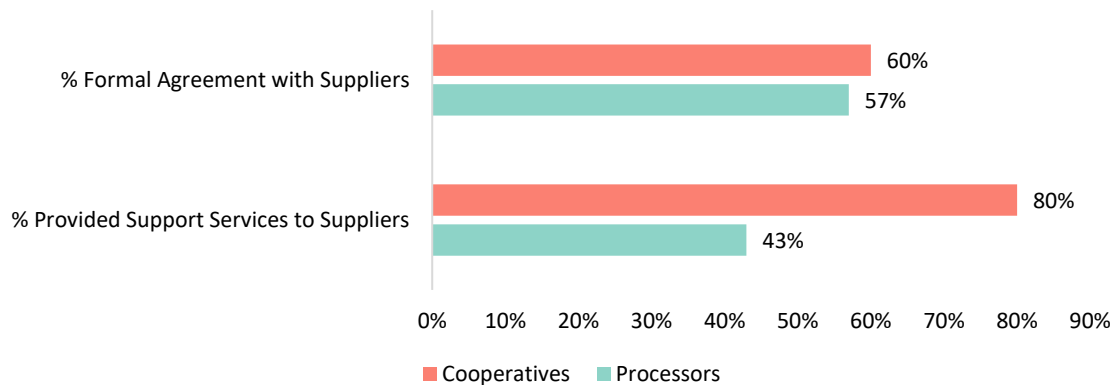


Note: Response rate varies by supplier type from as low as one observation to as many as six observations for volume of milk procured from a given supplier to compute average volume of milk by supplier type. Responses for a given season add up to 100%, as dry and rainy season supplier procurement was asked separately.

#### Agreements and Support Services

Next, we examine formal agreements with suppliers and support services provided to suppliers by firms in our sample. More than half of both cooperatives and processors reported having formal agreements with their suppliers (**Exhibit 82**). Qualitative findings revealed that most formal agreements were signed at the beginning of MERCADO and covered basic aspects related to the quantity of milk to be supplied. For instance, one cooperative signed contracts with its 18 suppliers. However, all cooperatives and processors mentioned that farmers generally did not fully comply with the terms of their agreements, as most side-sell and therefore provided less than the promised volume of milk to the cooperatives. Some cooperatives said that, because the main processor delayed payment to its milk suppliers, they had to stop their supply, so many of them had outstanding collections at the time of the survey.

## Exhibit 82. Had Cooperative and Processor Agreements with and Support Services to Suppliers



*N = 5 cooperatives and 7 processors*

Beyond formal agreements, 80 percent of the cooperatives and 43 percent of processors said they provided support services over a range of activities to their suppliers (**Exhibit 81**). For cooperatives, these services included selling supplemental fodder and veterinary medicines to their farmers. Cooperatives debited these costs against the farmers' milk supply credits. Many cooperatives also said they trained their suppliers on improving animal nutrition and health, milking techniques, hygiene, and milk transport. Finally, qualitative findings revealed that some processors and cooperatives want to eventually provide services like veterinary advice, agronomic assistance, and business and management services to their suppliers. However, they are currently unable to do so, as the market for such services does not yet fully exist, primarily because the farmers do not have enough cash to pay for these services.

...I would like to provide transport services, but the cooperative is not making any profit and cannot undertake new expenses or investments.

– Cooperative leader

### **Challenges in Milk Procurement**

The firms in our sample identified four main challenges in increasing procurement of raw milk.

- **Seasonal nature of milk procurement.** As shown in **Exhibit 79**Exhibit 77, milk procurement is seasonal, with farmers supplying less milk in the rainy season than in the dry season. However, demand for milk is higher in the rainy season. Therefore, the farmers, cooperatives, and processors are missing huge potential profits. The seasonal discrepancy in *milk procurement* is caused primarily by poor transportation conditions in the rainy season. Farmers cannot transport milk because roads are bad in the rainy season and the farmers do not have motorbikes or other suitable means of (cooled) transport to the collection centers.<sup>59</sup> Many

<sup>59</sup> All cooperatives and processors mentioned transport as being a major bottleneck during the semi-structured surveys. Further, there is variation even within provinces. In Sofala, respondents reported large walking distances. Even in Sussundenga in Manica walking distances were high. Many cooperatives and processors mentioned the need of a motor bicycle for reaching out permanently to their suppliers in order to know why they are bringing less milk and searching for new or additional suppliers. Further, the rainy season makes transport more difficult.

cooperatives expressed the need to discuss transport issues at the dairy focal points, where government officials, project staff, and farmers come together.<sup>60</sup>

- **Low prices paid to farmers and cooperatives.** Firms said that the prices paid to farmers by cooperatives and to cooperatives by processors were too low. Cooperatives expressed the opinion that there should be a clear price differential among different qualities of milk. When processors price milk of a higher bacteria count and milk of a lower bacteria count the same, providers are not motivated to improve quality. Low prices incentivize farmers to sell their milk in the local market rather than to cooperatives and processors.

...The price at the informal market doubles the price paid by the cooperative. We have to learn to be strong and negotiate. MERCADO is a slow project; we have to learn to do it ourselves, but we are milk farmers and have no time for the business side. My feeling is that our cooperative should have made a different arrangement with our main buyer for a better price.

– Farmer

- **Changes in the market of contract selling.** Respondents identified as a major issue lack of compliance with contracts and the resulting payment interruptions. Non-compliance happens at all levels, from farmers to processors. These interruptions affect the whole value chain. For instance, in Sofala, the largest processor did not pay its suppliers, which in turn could not pay its small producers. Firms said that they had difficulty accessing short-term loans and believed that MERCADO should help them get loans. Most cooperatives were working without contracts in a cash-and-carry system; this system is a major constraint for their growth in procurement. Possible solutions, according to cooperatives, would be accessing working capital from banks or making agreements for monthly deliveries and payments with suppliers.

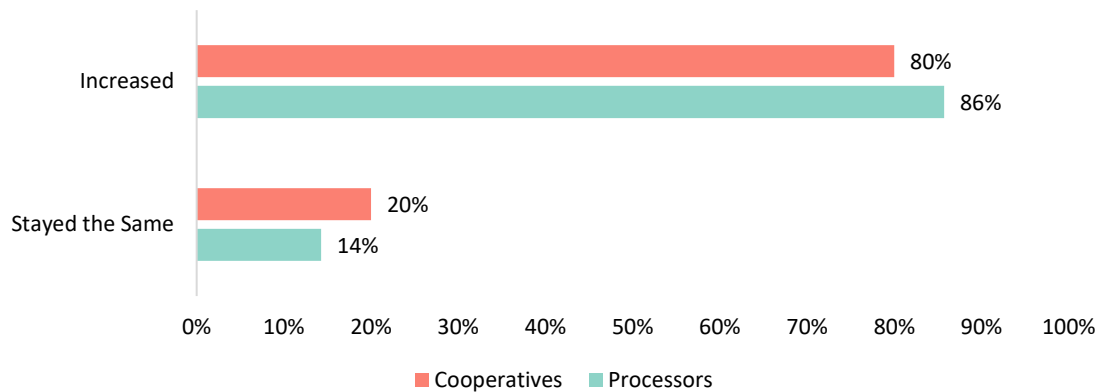
### ***Impact of MERCADO on Milk Procurement***

The majority of cooperatives (80 percent) and processors (86 percent) reported an increase in their procurement because of engagement with MERCADO (**Exhibit 83**). For about 20 percent of cooperatives and 14 percent of processors, there was no change. The cooperatives and processors said that any increases were not enough to enable them to break even and that the project had been slow to tackle the barriers mentioned above to facilitate even larger increases in procurement.

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<sup>60</sup> Triangulating this with quantitative data, we find that transportation costs for microprocessors are on average 150 meticals per month. The average monthly cost of milk procurement for microprocessors from **Exhibit 79**, is 600 meticals per month. This implies that the **total procurement cost including transportation**, is almost 25 percent higher than the procurement cost of only milk.

**Exhibit 83. Changes in Milk Procurement due to MERCADO**



*N = 5 cooperatives, 7 processors*

### ***Impact of Cyclone Idai on Milk Procurement***

Cyclone Idai significantly affected milk procurement: 80 percent of the cooperatives and 62.5 percent of the processors reported reductions in volume of milk procured due to the cyclone (**Exhibit 84**). Cooperatives did not report on the amounts of volume lost. For processors, the reduction in volume was substantial. The average reduction was about 2,908 liters per month. However, this average hides important variations. The largest processor, for instance, had a monthly reduction of 10,000 liters per month, while the smallest microprocessor had a reduction of only 40 liters per month – only around 3 percent of monthly procurement.<sup>61</sup> For the largest processor, this was a significant decline — almost a sixth of monthly procurement.<sup>62</sup> In terms of procurement values, all of the processors and three-fourths of cooperatives reported no change in the prices they paid to suppliers for raw milk after the cyclone. It is possible that the reduction in milk production was associated with a reduction in milk demand, and therefore the price paid to suppliers did not change much after the cyclone.

Qualitative findings reveal that Cyclone Idai was a factor in stagnating growth. Although MERCADO supported the firms in repairing damage, the major impact was the shortage of fodder, an issue that will be resolved only with the next summer crop of green fodder and corn. Farmers fed their cows less, so they supplied less milk to cooperatives and processors. Furthermore, the cyclone destroyed roads that were already inadequate; several dairy access routes had yet to be reopened at the time of data collection. The cyclone thus revealed the extreme vulnerabilities in the region's animal feeding and dairy supply systems. Retail dairy sales were flat after the cyclone, according to some cooperatives and processors, but many shops were trying to compensate for lower consumer demand by selling to public agencies and entities.

Thus, according to cooperatives and processors, Cyclone Idai raised barriers to their performance and growth plans. They considered the most vulnerable areas of the dairy value chain to be (1) low reserves of animals and (2) the calving cycle wherein fewer calves were born. They said that the dairy system's

<sup>61</sup> For the smallest microprocessor, the monthly procurement volume is about 1,500 liters per month. Hence, the reduction of 40 liters per month due to Cyclone Idai reflects only 3 percent of that amount.

<sup>62</sup> Exhibit 75 shows that the total procurement volume for the largest processor for the rainy season (approximately lasting six months) was 368,842 liters. The monthly procurement volume is therefore approximately 61,473 liters. Hence, the reduction of about 10,000 liters per month due to Cyclone Idai reflects one-sixth of that amount.

lesson learned is that farmers have to cultivate more grasslands, which are less vulnerable to natural disasters, and to increase their silage of corn/maize in order to be less dependent on buying fodder.

Finally, the breeder also felt some impact of Cyclone Idai since it is also a processing company. The cyclone hindered calving, which in turn dramatically decreased the milking level; the processor's production dropped from 2,500 liters per day to 1,500. The processor was still feeling the impact of Idai at the time of data collection and foresaw it taking until the end of 2019 to achieve their pre-Idai level of daily output.

**Exhibit 84. Changes in Milk Procurement due to Cyclone Idai**

| Variable                                      | Cooperatives     | Processors   | Mean         |
|-----------------------------------------------|------------------|--------------|--------------|
| <b>Volume of Milk Procurement</b>             |                  |              |              |
| Increased after Cyclone Idai                  | 0%               | 12.5%        | 7.69%        |
| Stayed the same after Cyclone Idai            | 20%              | 25%          | 23.08%       |
| Decreased after Cyclone Idai                  | 80%              | 62.5%        | 69.23%       |
| N                                             | 5                | 8            | -            |
| Reduction in procurement, in liters per month | N/A <sup>1</sup> | 2,908 liters | 2,908 liters |
| N                                             | -                | 5            | -            |
| <b>Price Paid to Suppliers</b>                |                  |              |              |
| Stayed the same after Cyclone Idai            | 75%              | 100%         | 90.91%       |
| Decreased after Cyclone Idai                  | 25%              | 0%           | 9.09%        |
| N                                             | 4                | 7            | -            |
| Reduction in price, in meticaís per liter     | \$0.04           | N/A          | \$0.04       |
| N                                             | 1                | 1            | -            |

*Note: N corresponds to the value above it and is the number of businesses who reported their procurement figures.*

<sup>1</sup> Cooperatives provided only imprecise qualitative answers.

1 USD = 70 meticaís

#### **4.2.2 Procurement for the Breeder**

The one breeder in our sample used AI for breeding. The breeder expressed the belief that, for pure breeding or specific crossbreeding, AI is the best way to improve the herds in the Beira corridor. The breeder said that they produced the semen at the farm and that two inseminators completed the process using estrous synchronization. They transported the nitrogen for semen storage from Maputo.

At the time of data collection, the breeder was producing pure Jersey heifers, a choice that reflected the demand of the MERCADO beneficiaries. Although the breeder said it did not currently have the resources to experiment with crossbreeding, it had plans to crossbreed a stabilized mix from a local race and a pure Jersey.

According to the breeder, Jersey is the best breed for Mozambique, as it has a high heat tolerance and produces a relatively large quantity of milk per kilogram of body weight. Before breeding Jersey cattle, the breeder started with semen donated by the Mozambique government, with less success. Venture37 helped the breeder to import semen, which would have been very difficult for the business to do on its own. At the time of data collection, the breeder had 600 cattle on the farm, including 270 milking cows.

### 4.2.3 Processing of Raw Milk

**Exhibit 85** shows findings on processing of raw milk. On average, processors had a capacity of 31,200 liters in the rainy season and about the same, 30,000 liters, in the dry season. However, they processed a lower volume of milk in the rainy season, 8,680 liters, compared to 9,375 liters in the dry season. This finding is unsurprising, as procurement of milk (**Exhibit 79**) is higher in the dry season. Finding that firms tended to over-report their actual utilization of capacity, we report not only their self-reported utilization but also an imputed value calculated by dividing volume actually processed by capacity. On average, firms reported utilizing 80 percent of their capacity in the dry season and about 63.33 percent in the rainy season. However, their actual utilization, based on imputation, was only 41.43 percent in the rainy season and 36.67 percent in the dry season.

**Exhibit 85. Milk Processing Volume and Capacity for Processors**

| Variable                                                                          | Rainy Season  | Dry Season    |
|-----------------------------------------------------------------------------------|---------------|---------------|
| Volume of raw milk processed                                                      | 8,680 liters  | 9,375 liters  |
| Processing capacity                                                               | 31,200 liters | 30,000 liters |
| Percentage of processing capacity utilized, self-reported                         | 63.33%        | 80%           |
| Percentage of processing capacity utilized, imputed (volume processed ÷ capacity) | 41.43%        | 36.67%        |

*N = 5 for Processors*

### 4.2.4 Sales of Milk and Milk Products

This section examines the sales of milk and milk products for cooperatives and processors, reporting buyer types and sales volumes and values for cooperatives and processors for dry and rainy seasons.

#### **Sales for Cooperatives**

Processors were the most common buyers for cooperatives in both dry and rainy seasons (**Exhibit 86**). In the dry season, 40 percent of the cooperatives sold directly to consumers and 40 percent to other businesses, while 20 percent sold to retailers and 20 percent to others. In the rainy season, the proportion that sold to consumers was lower at 20 percent, while the proportion selling to other businesses was the same as in the dry season at 40 percent. A possible explanation is that, in the dry season, the cooperatives procured more milk, and the only way to allocate this additional volume was to sell it directly to consumers. In the rainy season, the procurement was lower, and most of the regular volume cooperatives sold to the processors or regular buyers, leaving a small volume for the direct-to-consumer market.

**Exhibit 87** presents the volume and value of sales. The average volume of raw milk sales for cooperatives was 24,475 liters in the dry season and 16,173 liters in the rainy season. The average value of sales was correspondingly higher in the dry season: USD 6,996 (489,772 meticaís) in the dry season and USD 5,700 (399,033 meticaís) in the rainy season. As expected, there was no seasonal difference in the average price per liter of raw milk sold for cooperatives. Most of the seasonal differences in value of milk sales arose from differences in volume, not price.

#### **Sales for Processors**

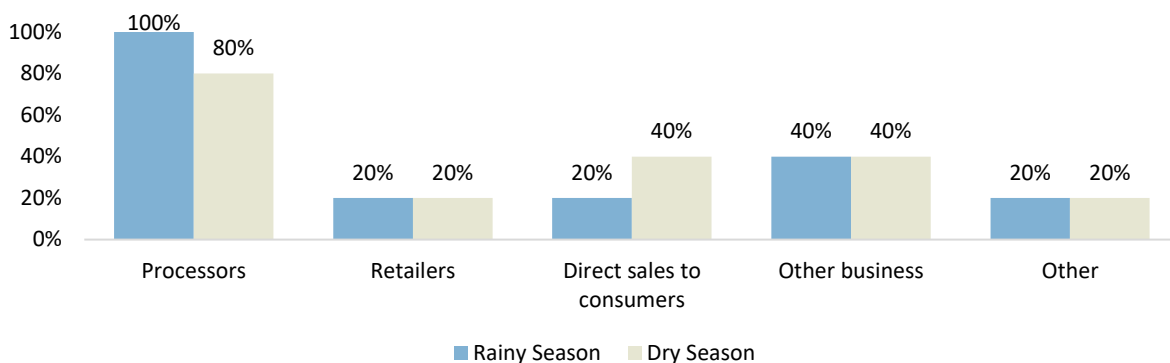
The most common type of buyers for processors was consumers. In the dry season, other common buyers included retailers and other businesses; in the rainy season, other businesses were most common after consumers. **Exhibit 87** presents the volume and value of sales. The largest processor (whose procurement volumes and values we report for the rainy season in **Exhibit 80**) did not report

any sales information. **Exhibit 87** does not include that processor and is thus directly comparable to **Exhibit 79**, which also does not include the largest processor.

Processors operate on a much larger scale than cooperatives. The average volume of milk and milk products sold by processors in our sample was 7,156 liters in the rainy season and 7,375 liters in the dry season. As expected, the volume of sales for the dry season was higher than for the rainy season. When we compare these sales volumes to procurement volumes in **Exhibit 79**, we find that processors sold around 72 percent of the amount they procure in both rainy and dry seasons.

Predictably, the average value of sales for processors was higher in the dry season than in the rainy season. Sales in the dry season were USD 5,313 (371,945 meticaïs); in the rainy season, the average value of sales was much lower at USD 3,177 (222,407 meticaïs) because volume is lower in the rainy season.

**Exhibit 86. Buyer Types for Cooperatives**



*N = 5 cooperatives. We allowed multiple options so responses add up to more than 100 percent.*

**Exhibit 87. Volume and Value of Sales for Cooperatives and Processors, by Season**

| Milk Sold                                                            | Rainy Season  | Dry Season    | Mean          |
|----------------------------------------------------------------------|---------------|---------------|---------------|
| <b>Cooperatives</b>                                                  |               |               |               |
| Average total volume of raw milk sold                                | 16,173 liters | 24,475 liters | 28,410 liters |
| N                                                                    | 4             | 4             | -             |
| Average total value of raw milk sales                                | \$5,700       | \$6,996       | \$6,348       |
| N                                                                    | 3             | 5             | -             |
| Average price per liter of raw milk sold                             | \$0.31        | \$0.30        | \$0.30        |
| N                                                                    | 4             | 5             | -             |
| <b>Processors<sup>1</sup></b>                                        |               |               |               |
| Average total volume of milk products, such as milk and yogurt, sold | 7,156 liters  | 7,375 liters  | 7,265 liters  |
| N                                                                    | 4             | 4             | -             |
| Average total value of milk and milk product sales                   | \$3,177       | \$5,313       | \$4,245       |
| N                                                                    | 5             | 6             | -             |
| Average price per liter of milk and milk products sold               | \$0.68        | \$0.63        | \$0.65        |
| N                                                                    | 6             | 6             | -             |

*Note: N corresponds to the observations used to generate the average value above it and is the number of businesses who reported in each category.*

<sup>1</sup> The largest processor in the sample did not report volume and value of sales.

1 USD = 70 meticaïs



### Challenges in Milk and Milk Product Sales

According to business respondents, infrastructural bottlenecks were a major challenge in selling milk and milk products. The level of transportation and infrastructure seemed not to have evolved sufficiently to support a successful dairy value chain in the Beira corridor. The other major challenge was the low price received for milk and milk products, leading to small profits and stagnation, except in the case of some of the large processors. According to the cooperatives, procurement and sales were still lower than necessary to earn enough money to break even. One main reason cited was the increase in side-selling of milk in the informal market, so that the formal value chain did not have the expected volume of milk.<sup>63</sup> Cooperatives, who

received only 20 meticaís for each liter of milk on average, started selling directly to consumers and public institutions like schools to remain viable. The general perception among cooperatives was that vertical integration with only one large processor was risky and was likely to create a monopolistic market structure. Respondents felt that the best strategy would be to connect the smaller and mid-sized payers to a secure sales business. Overall, incomplete and broken links in the value chain were the main concern for cooperatives and microprocessors.

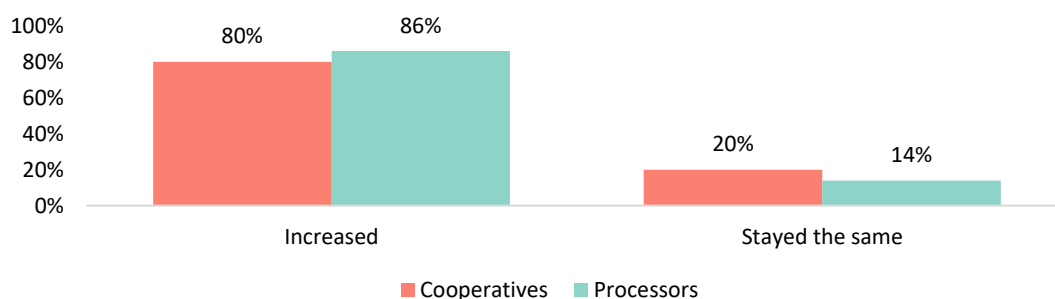
...We need to mobilize more investment funds and strengthen our marketing. There are many opportunities in this industry. The milk value chain has again fortified without a doubt, but with the level and expectation of the MERCADO project one should have done more. We hoped for more.

– Processor

### Impact of MERCADO on Milk and Milk Product Sales

As with milk procurement, the majority of cooperatives (80 percent) and processors (86 percent) reported increased milk sales because of engagement with MERCADO (**Exhibit 88**). For about 20 percent of cooperatives and 14 percent of processors, there was no change.

**Exhibit 88. Changes in Cooperative and Processor Milk Sales due to MERCADO**



N = 5 cooperatives, 7 processors

<sup>63</sup> Consider the targets and achievements of indicator 18, “Amount of milk processed in Mozambique from Mozambique produced fresh milk”; indicator 19, “Total value of value-added products made from milk”; and indicator 21 “Percentage of processor capacity utilized in Mozambique.”

Even though sales increased during the MERCADO project, the majority of the interviewed cooperatives and processors and the breeder saw sales as their main bottleneck. Only one investment made with support of the DIF was clearly dedicated to increasing sales. Respondents frequently mentioned the need for more project investment in improving sales. The qualitative findings revealed a great deal of discussion about the right business model and effective marketing and sales strategies, but little sales and marketing action. Traingulating this with MERCADO's semi-annual performance reports, reveals that training on marketing and sales has been regular feature of the project. This discordance between respondent's views and project reports implies that either repondents feel that trainings on marketing and sales are insufficient or the current curriculum in the trainings is not effective.

...Improving the turnover of Mozambique's dairy is the only way out. Therefore, presently the bottleneck is the market.

– Breeder

### **Impact of Cyclone Idai on Milk and Milk Product Sales**

As milk procurement was reduced due to Cyclone Idai, so milk sales by cooperatives and processors also decreased. More than 70 percent of the processors and 80 percent of the cooperatives reported reduced sales due to Cyclone Idai (**Exhibit 89**). Milk prices received from buyers did not change for any of the cooperatives; one processor reported decreased prices due to the cyclone.

**Exhibit 89. Changes in Cooperative and Processor Milk Sales due to Cyclone Idai**

| Milk Sales                             | Cooperatives     | Processors   | Mean         |
|----------------------------------------|------------------|--------------|--------------|
| <b>Volume of Milk Sales</b>            |                  |              |              |
| Stayed the same after Cyclone Idai     | 20%              | 28.57%       | 25%          |
| Decreased after Cyclone Idai           | 80%              | 71.43%       | 75%          |
| N                                      | 5                | 7            | -            |
| Reduction in sales in liters per month | N/A <sup>1</sup> | 3,940 liters | 3,940 liters |
| N                                      | 3                | 5            | -            |
| <b>Price Received from Buyers</b>      |                  |              |              |
| Stayed the same after Cyclone Idai     | 100%             | 85.71%       | 91%          |
| Decreased after Cyclone Idai           | 0%               | 14.29%       | 9%           |
| N                                      | 4                | 7            | -            |

Note: N corresponds to the observations used to generate the average value above it and is the number of businesses who reported their sales figures.

<sup>1</sup> Cooperatives provided only imprecise qualitative answers.

### **4.2.5 Sales of Heifers and Cows and Plans for Breeding**

The one breeder in our sample did not sell any unbred heifers and cows. It reported sales only of in-calf heifers. The breeder reported selling 16 in-calf heifers in the last 12 months to one client and another six to other farmers. At the time of data collection, the breeder was not prepared to sell more cattle because it was focusing on improving its own farm, especially the feeding equipment, and making sure it had fodder reserves for future events.

The breeder expressed the belief that sales would be difficult in the future, both within Mozambique and outside. Within Mozambique, MERCADO farmers will not be able to pay the full price for in-calf heifers in the future, as almost all beneficiaries up to now have received their cattle through the DIF.

Thus, the breeder did not believe there would be a large market after 2021 for in-calf heifers since farmers may not have enough money to pay for cattle on their own.<sup>64</sup> Further, export would be difficult, as Mozambique does not have a strong sanitary status for bovines. The breeder was planning to increase the stock of Jersey cows and sell a part of the new breed until the MERCADO project ends in 2021. However, although the firm did not anticipate selling cattle in the future, the respondent saw the breeding business as viable for its own farm because its affiliated processor needed more milk. This security made the firm a privileged player in the dairy value chain.

### 4.3 Milk Quality Testing

In this section, we report on the types of quality checks, methods of quality checks, and rejection rates for milk and milk products by cooperatives and processors.

#### 4.3.1 Quality Checks of Milk and Milk Products

Testing for mastitis, testing pH level for acidity, and testing for freshness were the most common types of testing among cooperatives and processors (**Exhibit 90**). More than 60 percent of cooperatives tested antibiotic residues, butter and fat content, and bacteria; less than 30 percent of the processors conducted each of these quality checks. In general, cooperatives conducted more tests on the incoming milk than processors, except that processors reported testing for water adulteration more than cooperatives, on average.

We report the instruments used by cooperatives and processors to conduct quality checks in **Exhibit 91**. In line with the findings on quality checks, most cooperatives used instruments for testing the quality of incoming milk, while more than two-fifth of the processors did not use any instrument for testing. Taste, smell, and visual inspection were the most common tests conducted by all the cooperatives and 57 percent of the processors. Cooperatives ranked higher than processors in use of simple instruments such as testing for milk density using lactometers and testing temperature, while processors ranked higher than cooperatives in more sophisticated use of testing instruments, such as clot-on boiling tests, Gerber tests for fat, and pH tests.

...Based on training, we are now better able to calibrate the pH test and improved the testing for mastitis.

– Cooperative

**Exhibit 90. Milk and Milk Product Quality Checks by Cooperatives and Processors**

| Quality Check                 | Cooperatives | Processors | Mean   |
|-------------------------------|--------------|------------|--------|
| Water adulteration            | 40%          | 71.43%     | 58.33% |
| Bacteria                      | 60%          | 28.57%     | 41.67% |
| Butter and fat content        | 80%          | 28.57%     | 50%    |
| Antibiotic residue            | 60%          | 28.57%     | 41.67% |
| pH tests for level of acidity | 100%         | 85.71%     | 91.66% |
| Testing for mastitis          | 100%         | 71.43%     | 83.33% |
| Testing for freshness of milk | 80%          | 71.43%     | 75%    |

Note: N = 5 cooperatives, 7 processors. Multiple responses were allowed, so responses add up to more than 100%.

<sup>64</sup> This refers to only those farmers who would still require in-calf heifers after 2021. For those MERCADO project beneficiaries who purchased cattle before 2021 and whose cattle are still alive post-2021, purchase of in-calf heifers would not be necessary. This is because they would be able to have their own calves.

**Exhibit 91. Testing Instruments Used by Cooperatives and Processors**

| Instrument                           | Cooperatives | Processors | Mean   |
|--------------------------------------|--------------|------------|--------|
| No instruments                       | 0%           | 42.86%     | 25.00% |
| Taste, smell, and visual observation | 100%         | 57.14%     | 75.00% |
| Lactometer for milk density          | 100%         | 28.57%     | 58.33% |
| Clot-on boiling test                 | 0%           | 28.57%     | 16.67% |
| Gerber tests for fat                 | 20%          | 42.86%     | 33.34% |
| pH tests for level of acidity        | 40%          | 57.14%     | 50.00% |
| Temperature                          | 20%          | 14.29%     | 16.67% |

*Note: N = 5 cooperatives, 7 processors. Multiple responses were allowed, so responses add up to more than 100%.*

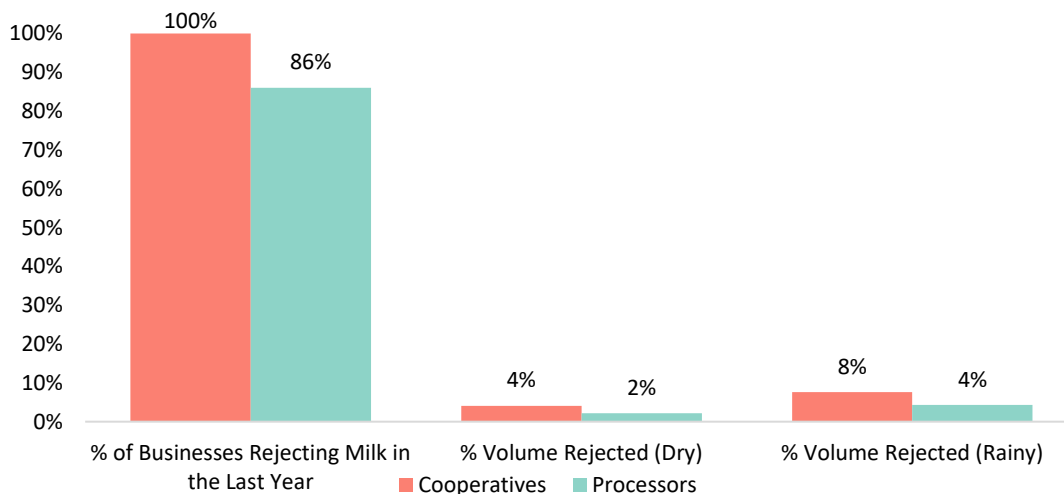
### 4.3.2 Milk Rejection Rate

**Exhibit 92** reports the proportions of cooperatives and processors who rejected milk in the last 12 months and on the volume of milk rejected in the rainy and dry seasons.

All cooperatives and 86 percent of processors rejected some milk in the last 12 months. Cooperatives in general rejected a higher percentage of incoming milk on quality grounds than processors. Cooperatives rejected 4.6 percent of the incoming milk in the dry season, while processors rejected 2.1 percent. The number for both about doubled in the rainy season: 7.6 percent for cooperatives and 4.3 percent for processors.

The significant jump in the rejection rate in the rainy season across cooperatives and processors could be due to higher levels of contamination caused by weather-related factors. Road conditions are much worse during the rainy season, requiring a longer transportation time for the milk from the farms to the collection center, thereby increasing the milk's bacteria content. Due to transportation issues during the rainy season, some farms deliver the afternoon milk together with the morning milk (although some use different cans or boil the milk prior to delivery), causing more rejection of milk.

**Exhibit 92. Milk Rejection Rates and Volume Rejected for Cooperatives and Processors**



*N = 5 cooperatives, 7 processors.*

### 4.3.3 Challenges in Milk Quality Testing

While all cooperatives and processors reported using some testing devices and equipment, there are many challenges with testing, quality, and safety of milk supplied along the value chain. These include:

- **Damage of testing equipment due to Cyclone Idai.** Respondents reported that Cyclone Idai damaged a lot of testing equipment. Some mentioned that, even many months after Idai, they had been unable to repair their equipment, so that they were unable to conduct milk testing.
- **Urgent need for additional testing equipment.** Some cooperatives and processors emphasized that they needed additional equipment and wanted to use the DIF to purchase it. However, they felt that the process of allocation of funds from the DIF was opaque, with no objective criteria on who gets funding.<sup>65</sup>
- **Lack of price differential based on quality.** Many cooperatives felt that, although processors either received or rejected milk based on quality, there was no quality-based price differential. Further, they said that, even in cases where a price differential did exist, processors did not test to determine prices; rather, the price paid was based on prior prices, which often would be lower.

Respondents felt that the MERCADO project had helped farmers, cooperatives, and processors in learning hygienic techniques for milk handling and checking milk quality. This improvement in the low levels of milk rejection by the cooperatives, signals better hygienic practices by farmers. Although processors were not reflecting hygienic practices in the prices, the largest processor said that it was now prepared to review the prices paid to smallholder farmers, cooperatives, and processors based on levels of quality.

## 4.4 Equipment and Labor Use

This section reports on the types of equipment used, financing for infrastructure, and types of labor hired by cooperatives and processors.

### 4.4.1 Equipment

Bulk milk tanks and bulk refrigerators were the most common equipment owned by cooperatives and processors, with 80 percent of cooperatives and 83 percent of processors owning each (**Exhibit 93**). Pasteurizers were slightly less common, owned by half of processors and three-fifths of cooperatives. Chilling systems were rare among cooperatives, but more than 65 percent of processors owned them.

### 4.4.2 Financing for Infrastructure

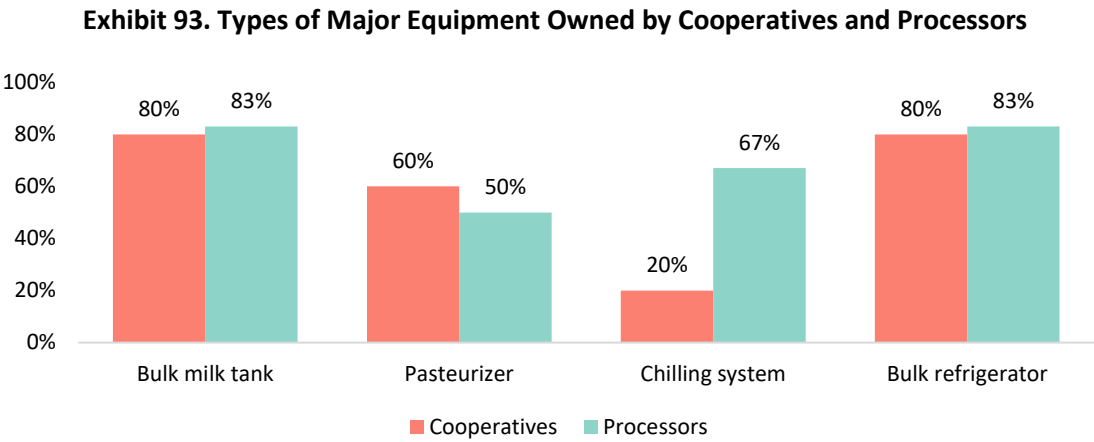
Existing and new dairy milk producers, cooperatives and aggregators, input businesses, and service providers use MERCADO DIF grants for co-financing equipment, infrastructure, and other innovations to expand their businesses.<sup>66</sup> The cooperatives, processors, and breeder showed great interest in using the DIF to increase their procurement, processing, collection, and sales. Some cooperatives that had shut down restarted their business operations when MERCADO proposed investing in equipment and

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<sup>65</sup> According to project staff, grants made through the DIF are transparent and have clearly defined objective criteria. These are advertised nationally through cooperatives and introductory meetings. Given the divergence in views regarding the transparency of the DIF, we recommend frequent dissemination of DIF selection criteria throughout the project period and not just at project launch.

<sup>66</sup> There are two “gates” for the DIF. Gate 1 is mostly used for grants, with a ceiling of \$12,000, and requires beneficiaries to contribute 20 percent while using 80 percent of grant funds for the purchase. Gate 2 extends to a ceiling of \$500,000 and requires at least 50 percent participation on the part of the beneficiary.

animals. Although most microprocessors were undercapitalized and had only made business plans as opposed to actually buying equipment, they said they might invest in the future when sales increase. Finally, a large processor used the DIF funds for investments in processing, packaging, and displayers for milk products like cheese and yogurt.

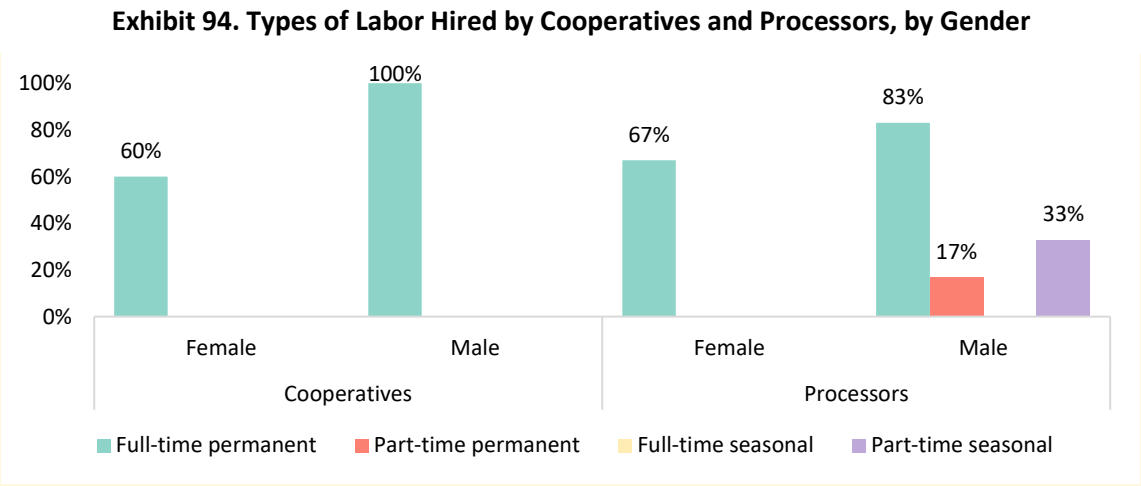


*N = 5 cooperatives, 6 processors. Multiple responses were allowed, so responses add up to more than 100%.*

### 4.4.3 Labor Use

Both cooperatives and processors primarily hired male workers, with all cooperatives and 83 percent of the processors hiring full-time male labor, as shown in **Exhibit 94**. Although men dominated, the proportion of female employees among permanent employees was higher for processors (67 percent) than for cooperatives (60 percent).

Cooperatives in the sample did not hire any part-time or seasonal labor; 17 percent of processors hired part-time permanent labor and 33 percent hired part-time seasonal labor.



*N = 5 cooperatives, 6 processors*

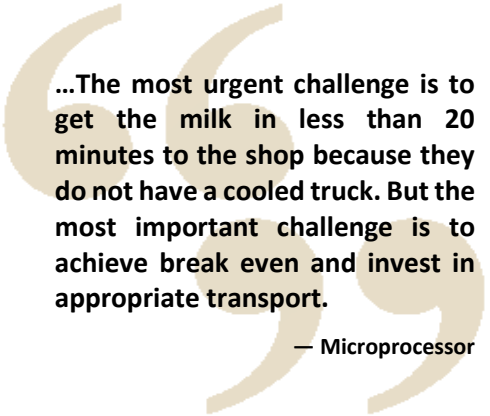
### 4.5 Future Plans

We conclude this section by describing the future plans of cooperatives, processors, and the one breeder in our sample.

#### 4.5.1 Cooperatives and Processors

Some cooperatives said they have plans for investing in a production facility for supplements; others planned to install equipment for making yogurt. All three large dairy processors (the fourth was limited at the time of data collection by management and cash liquidity constraints) said they have plans to expand and expected the dairy sector to take off in the coming years. One processor, the largest and most important buyer for the cooperatives and processors in Manica and Sofala, was implementing an aggressive sales strategy. Another processor experienced a drop in daily output from 2,500 liters to 1,500 liters because of Cyclone Idai. By the end of 2019, this processor said it is planning to restore the pre-Idai level of daily output of 2,500 liters; then it said it is planning to expand in 2020 to 3,500 liters per day and in 2021 to 5,500 liters per day — that still is only 50 percent of the capacity of one shift. For processors to be profitable, they need not only to increase their production but also to seek new markets. This large processor was therefore looking toward the Maputo market, but the respondent said the firm needed more capital. MERCADO was interacting with this processor and wanted to support the expansion into new markets. Most increases would come from milk procured from MERCADO farmers.

Cooperatives and processors alike felt the need for investment in transportation. They recommended investing in cooled-cargo motorbikes and cooling tanks to collect milk from distant farmers to keep the bacteria content in milk low and maintain its quality. The largest processor's purchasing policy for procurement from cooperatives was to pay only 17 meticais per liter for milk with a total bacteria count of less than 50,000 per liter. However, this low price did not allow the cooperatives to break even in their dairy business, so both they and farmers engaged in side selling of large volumes of milk in the informal market. One processor also recommended installing smaller cooled tanks of 50 to 100 liters (as opposed to the present 300- to 1,000-liter tanks of the cooperatives) in the villages: one tank for five farmers. The processor saw this model in India.



**...The most urgent challenge is to get the milk in less than 20 minutes to the shop because they do not have a cooled truck. But the most important challenge is to achieve break even and invest in appropriate transport.**

— Microprocessor

#### 4.5.2 Breeder

Although at the time of data collection the breeder was producing only pure Jersey heifers, it was starting to experiment with crossbreeds between Jersey and Ayrshire and between Jersey and Senepol cattle. The breeder expressed the belief that these breeds would have high milk production and would be more disease-resistant than pure Jersey. Another crossbreed the breeder was considering was to cross a local breed with an imported breed. The resultant breed would be more adaptable to the climate and sanitary conditions of Mozambique than a pure imported breed such as Jersey.



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## SECTION 5. FINDINGS FROM ADDITIONAL STAKEHOLDERS

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This section presents additional qualitative data findings not documented earlier in the report. **Section 5.1** discusses the findings from the paravets, and **Sections 5.2** and **5.3** discuss findings from the key informant interviews with lecturers from educational institutions and with student interns. **Section 5.4** summarizes our interviews with government representatives at the national and provincial levels. Finally, **Section 5.5** summarizes additional information from our interviews with project staff and partners.

### 5.1 Paravets

Most paravets (community livestock workers) are young farmers with an interest in animal health care and are members of a cooperative. They are responsible for supporting the members of one or more farmers' associations. According to paravets, most of the farmers they support are small, with very few medium-scale farmers. In addition to MERCADO beneficiaries, some also work with private clients. Through MERCADO, the paravets reported receiving training in milk hygiene and safety, animal health (including disease diagnosis and mastitis testing), welfare and nutrition (for pasture and fodder), infrastructure maintenance, business development, and general examination of cattle.

Though all paravets said their interest in animal health motivated them, most reported looking for supplemental or parallel work. Many said they would like to engage more in their own dairy businesses. Almost all said they would not continue their work as paravets after MERCADO, as the farmers would be unable to pay for services. Paravets also reported not having enough medicines or medical supplies. Most said they would like to continue their work if they could receive financial support, as the cooperatives, the farmers, and the communities needed them. Most paravets had applied or were planning to apply for a DIF grant to help with their business. One of their most common requests from the fund was bicycles, as it is difficult for them to reach farmers in remote areas. Bicycles would allow them not only to respond quickly to farmers who have medical emergencies, but also to provide in-person refresher trainings to the farmers. Continuous training, they said, is key for farmers to provide improved animal nutrition practices.

#### 5.1.1 Services Provided

The paravets reported that their trainings in bathing and deworming were most successfully applied by the farmers. They also provided training on animal nutrition, which, when farmers applied the practices learned, resulted in greater milk production. Some paravets also trained farmers in how to plan fodder pastures, a topic that farmers often requested. According to paravets, most trainings are currently provided by MERCADO or a third-party organization. The paravets recommended that for sustainability, the cooperatives have a stronger role in organizing and leading trainings as well as provide additional resources, such as medicines and equipment, for their members to improve animal health.

Paravets reported that, in some communities, farmers resisted following the medical recommendations; these farmers persisted in outdated practices that were not appropriate for Jersey cows, a demanding breed. According to paravets, these farmers have lower milk production, less healthy cattle, and a greater likelihood of experiencing preventable cattle death. Paravets noted that women farmers tended to be more receptive to following medical advice and therefore were more successful in raising and caring for dairy cows.

#### 5.1.2 Best Practices Identified by Paravets

The paravets recommended best practices for the training activities. They said most farmers assimilated the training better when the training was at a farm location rather than at the cooperative location. The farmers assimilated training in animal nutrition better when paravets used local forage and local homemade mineral blocks. They also suggested that better results in diagnosis of diseases and control of

mastitis was likely when training took place on a client's farm. The paravets would like to have more support from the cooperative and the project for teaching supplies and materials, include audiovisual elements.



**We have innovative solutions.... There is no use importing non-feasible models that are not real and achievable in our context.**

**– Paravet**

The paravets believed that the single most important subject for the dairy farmers is animal nutrition, because many of the cattle they saw were not well fed. They said that dairy farmers should receive this training periodically because this subject is an area of vulnerability and a possible source of unsustainability for most dairy farmers. Paravets said that farmers did not fully understand the nutrition the Jersey breed needs to maximize milk production, and were critical of zero-grazing and having to buy expensive feed to support the demanding breed. They said that farmers required additional training on how to provide balanced nutrition, specifically the technique of creating reserves of dried grass. Paravets said such

training would increase the likelihood of farmers having sustainable dairy farms.

Some paravets also felt that the project should invest in people with experience, motivation, and some indicators of responsibility and commitment. They said the cooperatives could assist with identifying appropriate farmers. Another important point made by several paravets was that farmers did not know the selection criteria for beneficiaries of the DHF. The project should inform the farmers and cooperatives about its livestock delivery plan and conditions for acceptance to the DHF.

In line with the direction of MERCADO, paravets said that the project is not sustainable for very small farms. They suggested the project should require that farmers have at least four animals, in order to justify the investments required for infrastructure construction. It is not sustainable to build a corral when the farmer has only one or two cattle.

Finally, paravets said that the project should consider forage alternatives, as paravets believed that a dairy farm without grass pasture is not sustainable. To this end, the project should concentrate in more rural areas with more land.

## **5.2 Lecturers**

The two lecturers interviewed, from two different universities, were teaching livestock production and zootechnics and served as coordinators of professional internships for their students. One lecturer was participating with the local government's dairy focal point on behalf of the university.

Most of the lecturers' MERCADO-related activities revolve around implementation of a new curriculum on commercial dairy and animal nutrition. MERCADO developed the new curriculum plan around the availability of professional internship for students; it includes treatment practices, dairy cattle

management, and milk processing. The universities were in the process of *accommodating the investments for starting the curriculum at the department level.*

The governmental National Commission has evaluated the curriculum on dairy and livestock for Quality Assessment as the best curriculum at the national level, and the lecturers said it was a great improvement. One educational institution established a laboratory for primary examinations of milk and its derivatives. Another institution is developing a dairy farm and processing unit and is connecting with local producers in the region. These additions, along with the internships, increased the practical lessons and exchange experiences. The farming course, with its focus on animal production, has been welcomed enthusiastically by students. There are plans to set up a model farm for the region for training and demonstration sessions.

**The current curriculum is more competitive and up-to-date.... It is reinforced with a laboratory and reinforced by connections with local producers.... I appreciate that students have had greater opportunity in the same teaching space to have the practical and theoretical training.**

– Lecturer

The lecturers said that the internships greatly motivated students and raised their interest in the field of dairy cattle, especially in the components of nutrition, development of linkages and assistance to farmers, and processing. One institution now has a dairy farm with Jersey cows and with milk collection and processing units. Another institution has been involved in the campaign to promote consumption of dairy products. Lecturers report that in recent years there has been an increase in local milk production and consumption, and while there is still much to be done to increase demand, it has been growing.

The lecturers interviewed find that students now have greater opportunity to combine practical and theoretical learning. They encouraged their students to write proposals on business opportunities and technical and scientific subjects related to the dairy value chain. Some of their students had recently submitted a business plan on milk processing and derivatives to the microfinance bank GAPI. This submittal reveals students' desire to participate in the dairy industry, where the lecturers saw opportunities for their students in farming, processing, and retail.

Lecturers felt that the MERCADO project should further strengthen professional development and exchange of teachers to update their knowledge further. They also felt that the project should focus on increasing the practical components of the curriculum to include 50 percent hands-on experience, as students need practice with livestock. One strategy would be to have students directly support farmers through the extension services, as the lecturers and students observed that many local farmers were not following the best animal health and nutrition practices. Another suggestion by lecturers was that MERCADO should provide three or four cows to entrepreneurial students to enable them to start farming. This funding would be similar to funds from local microfinance banks to which students can apply for dairy start-ups post-graduation.

### **5.3 Student Interns**

The student interns interviewed for the midterm evaluation were highly motivated to start careers in the dairy sector. Many had already prepared business plans and wanted to submit them to the DIF or the DHF. Some of the students had parents who were farmers and were eager to continue the family business.

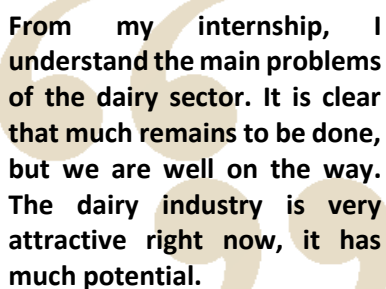
The internships allowed students to explore different areas of the dairy value chain, including farming, collecting and processing, and the business side. They worked closely with local farmers, giving support in disease diagnosis and animal feed production, manual and mechanized milking, milk processing, hygiene and safety in the milking process, animal health, animal nutrition and its relation to milk production, safety and quality testing, storage and cooling, milk sales, and technical and financial management components.

Students said they liked working on and visiting the farms with extensionists, as they observed firsthand what farmers practice and where farmers could make improvements. They said they preferred learning through hands-on work rather than theoretical classroom training.

Many student interns were critical of what they saw in the field. They expressed the belief that the current system of buying fodder was not economically sustainable for the dairy farmers. They also saw many farmers not using medicine correctly or not properly taking care of their animals. Some students wrote a letter to the local Venture37 project staff (to which they said they never received a response) questioning what measures were being taken for farmers who cared for their animals poorly, yet still received subsidies or benefits from the DIF. Some students reported instances of animal abandonment by the owners. According to Venture37 project staff (after the completion of field work), no such letter was received. Further, Venture37 project staff reported not having heard this perspective from student interns in their one-on-one conversations and exit interviews with them.

Student interns worked with small farmers, cooperatives, and large processors. Some found that the family sector was the biggest player in this industry but said that small farmers needed more support. One way to support them could be practical internships, organized at the very beginning of the course, during the first year. This strategy can help the students have more contact with the object of study while engaging and sensitizing students to learn solutions to help dairy farmers. All students said they appreciated the partnership between the MERCADO project and their school or university.

Most students expressed the opinion that, given the low consumption of milk in Mozambique, there is room for demand to increase, as it has in other countries. For example, some noted that the sales of yogurt had already increased. Most said that, as the internal market can only increase, now would be a good time to invest in the dairy business. Therefore, many were thinking about starting a dairy business with the support of MERCADO.



**From my internship, I understand the main problems of the dairy sector. It is clear that much remains to be done, but we are well on the way. The dairy industry is very attractive right now, it has much potential.**

**– Student intern**

Students emerged from their internships with new ideas for their futures. Some expressed interest in developing low-cost solutions for dairy cattle nutrition. One student wanted to help small family farmers by efficiently linking them to feed factories to lower costs. This student recognized that high-quality rations were too expensive for most farmers, a factor in low milk production. Other students had a more academic focus and wanted to work in a laboratory learning more about the biochemistry of milk and dairy products.

A group of recently graduated students is submitting a proposal to MERCADO. The students said they want to add value to the chain by providing training on handling, processing technology, and safe milking techniques to help local farmers. They want to establish a

farm that would produce and process dairy products to meet the highest quality standards and be a center for business and technology. They realized that their ideas would require a great deal of money and that it would take time for their investment to pay off. However, like all the student interns, they recognized that the dairy industry has many opportunities. They said that they were committed to having quality at the forefront of their future work; otherwise, they would be just another actor in the market without results.

## **5.4 Government Representatives**

Respondents at the national level said that the Mozambican government is highly invested in developing a modern dairy sector in the country. To this end, government officials said they were pushing forward several regulations to standardize the industry, including requirements around animal health, feed

formulation, regulation of medicine, and manufacturing practices. With the support of Venture37, the government is creating a national dairy development strategy, the first in the country's history. The government is also showing its commitment to building the dairy sector by removing import tariffs to support cooperatives and processors in buying equipment.

Provincial respondents said that local government is also highly invested in the dairy sector. By creating dairy focal points, provincial government engages and coordinates different actors, including processors, cooperatives, and educational institutions. Government representatives at the national and provincial levels agreed that MERCADO is in line with the priorities of the government, especially in terms of food security. What is needed now, they said, is regulations for quality and safety.

#### **5.4.1 Bottlenecks to Growth**

The projects of Venture37 before MERCADO worked with small producers with up to five cows. Most were located in areas close to urban consumers, and the market absorbed the production. The focus of MERCADO is on larger farmers and processors, who do not buy all the milk from small farmers and pay low prices to the farmers. The larger farms are generating a much greater flow of milk, and the problem they face is a bottleneck in sales.

The Manica Veterinary Directorate said that one processor had an almost monopoly position and that the absence of large processors competing for the supply of milk was the reason for the low price and the overall poor result of the dairy sector. All eyes, this respondent said, were now on another potential processor, who might provide a more competitive price.

Another limitation to growth, according to government officials, was the poor culture of entrepreneurship among the farmers. They thought this could change if younger generations and more women entered the sector. There were only a few women farmers, they said, especially in relation to the proportions of men and women who acquired animals from the project. As women farmers were generally poorer than their male counterparts, these women faced additional limitations in the transport of milk and fodder, as they were less likely to have a reliable source of transportation.

#### **5.4.2 Sustainability of the Dairy Sector**

The key question for Mozambique's dairy sector will be the sustainability of MERCADO. Once the project ends, the present dynamics of the dairy market can fall back to previous levels, as they did so dramatically in 2016. Many dairy producers lost their animals, and at least three milk collection centers closed. The major processor stopped buying milk from farmers, and recently it reduced its price to 17 meticaïs, which is not sustainable for small-scale farmers.

Government representatives felt that they did not have a legal basis for intervening in the dairy sector, in terms of guiding development and setting quality standards, because the veterinary directorate has no extensionists in the dairy sector. When the project ends, the directorate will not hire the MERCADO extensionists, as they will not have the resources or capacity to hire and train them. However, government representatives said that the directorate is engaged in changing the agrarian statute, which is the most important regulation framework of the agriculture and

**17 MT is not a viable price for the small producers. It is unlikely that a small producer with a low yield would reach the break-even point with this price.**

– Provincial government official

livestock sectors in Mozambique. The new version includes the dairy sector and establishes a role for the directorate.<sup>67</sup>

The government is prioritizing the dairy sector; all related import tariffs have been withdrawn. In general, this respondent said, the milk industry seemed promising, because the imports of dairy were decreasing while the demand was increasing. Government representatives realized that the sector is still constrained, though, because of issues in buying and selling milk at competitive prices and quality. According to provincial government representatives, although MERCADO was correct in changing its focus from production to processing, it has not yet achieved clear results in terms of making the dairy industry more commercial and private sector driven. Even as the government of Mozambique has prioritized dairy, it has few means to develop the sector. The remainder of the MERCADO project will be key for the future of the dairy industry after MERCADO ends.

## **5.5 Project Implementers (Venture37 Project Staff and Partners)**

As mentioned in **Section 3**, the project is focusing on a smaller number of motivated farmers in order to create a viable and sustainable dairy value chain in the Beira corridor. Venture37 staff said they have phased out distributing free cows and free services to farmers and are committed to working with farmers who are truly invested in the dairy industry. The project has shifted to working with cooperatives and processors, rather than with individual farmers, as to reduce dependency and to work within the formal market. Staff noted that for the project to be sustainable, they need to increase the dairy yield – that is, increase the dairy herd size for individual farmers as well as increase the production of individual cows.

There have been several external factors which affected project progress, including natural causes such as Cyclone Idai and the outbreak of foot-and-mouth disease in South Africa (which delayed the import of cattle). Other challenges included a drop in the market price paid to the farmers, which led to an increase in farmers side-selling. The participation in the informal market is worrisome, as there is no mechanism for quality control; in addition, cooperatives are not able to properly plan for the amount of milk they receive, making it difficult for them to manage and connect with sellers. Project staff also suspected that the farmers are underreporting their actual milk production, as farmers are afraid to tell the project that they are not taking all their milk to the cooperatives. The project understands that dairy farmers need to be paid a fair price in order to stay in the formal market and has therefore started working with microprocessors as a potential buyer of milk to create competition.

The implementing partners said that the role of Venture37 in the Beira corridor is shifting. As there was absolutely no dairy industry, they had to start by providing materials and resources just to build farms from the ground up. However according to project staff, a lesson learned was that not all beneficiaries were ready and willing to become dairy farmers. Many did not fully understand the time and resources it takes to eventually break even (up to seven years, according to one project staff), so these farmers have either lost their cows due to lack of proper care or have sold or slaughtered their cows. Many staff said now is the time to focus on management, with the dedicated farmers who are participating in the project.

Overall, the project implementers are optimistic, and pointed to several areas of success, including the activities related to building government capacity. Having the government of Mozambique support the dairy industry is absolutely crucial to the ultimate sustainability of the dairy industry, as this support will continue long after the project has finished. Staff members also noted that success in dairy does not happen overnight, and it takes time for herd sizes to grow and milk production to increase. The results of some of the activities are just now coming to fruition, and it is still too early to evaluate if some initiatives

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<sup>67</sup> Jose Carvalho is involved in drafting this new statute.

will be successful or not. However, staff are confident that overall, MERCADO has made positive impacts, and will continue to do so in the second half of the project.



## SECTION 6. GENDER ANALYSIS

This section sheds light on key differences between women's and men's participation in the dairy sector in the MERCADO project area. **Section 6.1** examines women's participation in MERCADO project, while **Section 6.2** examines intra-household decision-making related to dairy farm production. **Section 6.3** focuses on household roles and division of labor on the farm. **Section 6.4** focuses on women's productivity and the challenges women face in operating in the dairy value chain. We have used qualitative data analysis to bolster our quantitative findings throughout this chapter because the sample size of female-headed farms and female-owned businesses in our survey data is small and limits confidence in the generalizability of the gender-disaggregated findings.

### 6.1 Women's Participation in MERCADO Dairy Projects

**Exhibit 95** outlines women's participation in the MERCADO project. In Manica, women constituted 40 percent of MERCADO farmers surveyed; in Sofala, 34 percent of farmers surveyed were female. Thus, only a third of all project participants in both provinces were female, with female participation being slightly higher in Manica than in Sofala. Women farmers have not become major stakeholders in the MERCADO project, despite the frequently expressed belief of paravets and processors that women are more efficient farmers. The interviews showed that many women did not participate in the DIF to fund purchase of animals or infrastructure.

**Exhibit 95. Women's Participation in the MERCADO Project**

| District and Province | Farmers Surveyed |      |        | Females as a Percentage of Total |
|-----------------------|------------------|------|--------|----------------------------------|
|                       | Total            | Male | Female |                                  |
| Gondola               | 79               | 42   | 37     | 46.83%                           |
| Macate                | 31               | 20   | 11     | 35.48%                           |
| Sussundenga           | 9                | 6    | 3      | 33.33%                           |
| Vanduzi               | 19               | 15   | 4      | 21.05%                           |
| Total Manica Province | 138              | 83   | 55     | 39.85%                           |
| Buzi                  | 0                | 0    | 0      | 0%                               |
| Dondo                 | 120              | 79   | 41     | 34.17%                           |
| Beira                 | 2                | 2    | 0      | 0%                               |
| Total Sofala Province | 122              | 81   | 41     | 33.60%                           |
| Total                 | 260              | 164  | 96     | 36.92%                           |

Even among women who were involved in the MERCADO project, their scale of operations tended to be smaller than that of men. **Exhibit 95** shows that, at bigger dairy farms, men dominated. Women constituted only 30 percent of medium-scale farmers in our sample. Further, women owned no large farms. **Exhibit 96** examines herd sizes of female and male farmers in the matched sample and compares these values to baseline. The total herd size of women farmers increased significantly from 2.12 cattle at baseline to 3.12 cattle at midterm (significant at the 5 percent level). Most of this increase came from an increase in the number of heifers, from 0.22 heifers on average at baseline to 0.52 at midterm. The number of dairy cows for women farmers also increased from baseline to midterm. These increases in herd size for women are encouraging because they represent future production potential. However, as **Exhibit 96** shows, women were still overwhelmingly small scale, and the average herd for male farmers was almost twice as large.

**Exhibit 97**, which examines herd composition by gender for the new midterm sample, shows that the skewed distribution of herd size between men and women continues to hold. Women, on average, had

3.40 cattle in their herds compared to 8.31 cattle for men. The number of dairy cows for women in the new midterm sample was also low: only 1.5 dairy cows on average compared to 3.36 for males.

These results show that women were operating at a smaller scale. While there were some improvements from baseline to midterm, there was still a lot of catching up to do.

**Exhibit 96. Distribution of Farms at Midterm by Scale and Gender**

| Scale of Farm | Number of Farms | Male Farmers | Female Farmers |
|---------------|-----------------|--------------|----------------|
| Small         | 157             | 58.60%       | 41.40%         |
| Medium        | 24              | 70.83%       | 29.17%         |
| Large         | 1               | 100%         | 0%             |

*Note: The sample includes all farmers with dairy cows who were surveyed at midterm, regardless of whether they were matched to baseline. Farm scale is defined as the midterm level.*

**Exhibit 97. Herd Composition by Gender for Matched Farmers**

| Cattle Type              | Males    |         | Females  |         |
|--------------------------|----------|---------|----------|---------|
|                          | Baseline | Midterm | Baseline | Midterm |
| Bulls                    | 0.74     | 0.60    | 0.22     | 0.29    |
| Cows                     | 2.47     | 2.74    | 1.16     | 1.42*   |
| Heifers                  | 0.98     | 1.41    | 0.22     | 0.52*** |
| Female calves            | 1.14     | 0.77    | 0.52     | 0.29    |
| Male calves <sup>1</sup> | N/A      | 0.65    | N/A      | 0.59    |
| Total cattle             | 5.33     | 6.17    | 2.12     | 3.12**  |
| N                        | 86       | 86      | 54       | 54      |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who currently owned cows at the time of the survey and were matched from baseline to midterm. Gender is defined as at baseline because there were inconsistencies in reporting of gender between rounds.*

<sup>1</sup> Respondents were asked about number of male calves only at midterm.

**Exhibit 98. Herd Composition by Gender for New Midterm Farmers**

| Cattle Type   | Males | Females |
|---------------|-------|---------|
| Bulls         | 0.68  | 0.20    |
| Cows          | 3.36  | 1.50    |
| Heifers       | 1.5   | 0.45    |
| Female calves | 1.95  | 0.60    |
| Male calves   | 0.81  | 0.65    |
| Total cattle  | 8.31  | 3.40    |
| N             | 22    | 22      |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who currently owned cows at the time of the survey and were new farmers at midterm.*

## 6.2 Intra-Household Decision-Making related to Dairy Production

Surveys showed that intra-household roles and responsibilities varied considerably depending on the gender of the respondent at baseline. The survey asked farmers who in the household made the final decisions on certain farm activities: male adult member, female adult member, and other individuals like paid workers and children in the household. We only report the values for male and female adult members

below.<sup>68</sup> The decision-making scenarios included allocation of revenue, distribution of dairy activities, whether to buy a dairy cow, whether to purchase dairy inputs or equipment, distribution of household activities, and how to spend crop income.<sup>69</sup>

**Exhibit 99** reports the gender breakdown of farm decision-making for the matched sample. It shows a pattern of more decision-making by men for all scenarios at baseline. This pattern held true at midterm, except for distribution of household activities, where a higher proportion of women (66 percent) than of men (38 percent) made the final decisions. Interestingly, as final decision-making on how to spend farm income increased significantly for women from baseline (38 percent) to midterm (61 percent), it decreased for men. This shift toward more decision-making by women from baseline to midterm is consistent for all scenarios, though it is not always statistically significant. At baseline, men were more likely to decide how to spend money, but the proportion of women deciding how to allocate revenue from milk sales increased from 31 percent at baseline to 40 percent at midterm (significant at the 10 percent level). Concurrently, the proportion of men deciding how to allocate money from milk sales declined from 61 percent at baseline to 58 percent at midterm, though the difference is not significant. Although the *absolute* proportion of women making decisions was still lower than for men, more women were making decisions on key aspects of farm management at midterm than at baseline.

Finally, at midterm, because respondents could choose both “adult male” and “adult female” as options, joint decisions between adult female and adult male can also be examined. For most decision-making scenarios, less than 20 percent of the decisions were jointly made. For instance, 18 percent jointly made the decision on how to allocate revenue from milk sales, while 15 percent jointly decided on whether to purchase a dairy cow. Interestingly, for the decision on how to spend crop income, around 32 percent of respondents reported making decisions jointly.

**Exhibit 99. Gender Breakdown of Household Decision-Making for Matched Sample**

| Decision Scenario                             | Male Adult Member |           | Female Adult Member |           |
|-----------------------------------------------|-------------------|-----------|---------------------|-----------|
|                                               | Baseline          | Midterm   | Baseline            | Midterm   |
| Allocation of revenue from milk sales         | 65.94%            | 57.57%    | 31.88%              | 40.00%*   |
| Distribution of dairy activities              | 68.12%            | 62.14%    | 27.54%              | 37.14%*   |
| Whether to buy a dairy cow                    | 71.74%            | 54.29%*** | 26.81%              | 29.29%    |
| Whether to purchase dairy inputs or equipment | 73.19%            | 62.86%    | 25.36%              | 31.43%    |
| Distribution of household activities          | 55.07%            | 37.86%*** | 42.75%              | 65.71%*** |
| How to spend crop income                      | 60.87%            | 55.00%    | 38.41%              | 60.71%*** |
| N                                             | 101               | 88        | 59                  | 92        |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who currently owned cows at the time of the survey and were matched from baseline to midterm. The Ns are the highest each sample segment; the number of respondents varied for each decision-making scenario. The female and male columns do not add up to 100% because a few responses took other options like “farm employee” or “relative” and we did not ask gender for these options. Additionally, for responses at midterm, respondents could choose both “adult female” and “adult male”.*

**Exhibit 100** presents the information on decision-making for the new midterm farmers. The same pattern holds: Men made more decisions for all scenarios except for distribution of household activities, where a higher proportion of women (62 percent) than men (41 percent) made the decisions. In contrast, a small

<sup>68</sup> Because of low responses for the other options like “farm employee” and “relative”.

<sup>69</sup> Crop income in most cases refers to milk but occasionally can include other food and cash crops grown by the farmer.

proportion of women (31 percent) made the decision on whether to buy a cow in comparison to a large proportion of men (62 percent).

Finally, like in the matched sample, joint decisions in the new midterm sample are also examined. In the new midterm sample, a higher proportion of decisions are jointly made. Around 25 percent of decisions about distribution of dairy activities are joint, while around 21 percent of decisions about whether to buy a dairy cow are joint. The decision on how to spend crop income is taken jointly by 35 percent of the sample, while 24 percent decide jointly on whether to purchase dairy inputs or equipment.

**Exhibit 100. Gender Breakdown of Household Decision-Making for New Midterm Sample**

| Decision Scenario                             | Male Adult Member | Female Adult Member |
|-----------------------------------------------|-------------------|---------------------|
| Allocation of revenue from milk sales         | 52.38%            | 33.33%              |
| Distribution of dairy activities              | 64.29%            | 45.24%              |
| Whether to buy a dairy cow                    | 61.90%            | 30.95%              |
| Whether to purchase dairy inputs or equipment | 64.29%            | 45.24%              |
| Distribution of household activities          | 40.48%            | 61.90%              |
| How to spend crop income                      | 59.52%            | 52.38%              |
| N                                             | 27                | 26                  |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who currently owned cows at the time of the survey and were new farmers at midterm. The Ns are the highest for each sample segment; the number of respondents varied for each decision-making scenario. The female and male columns do not add up to 100% because a few responses took other options like "farm employee" or "relative" and we did not ask gender for these options. Additionally, for responses at midterm, respondents could choose both "adult female" and "adult male."*

### 6.3 Gender Division of Farm Labor

The survey asked farmers whether male or female adult household members undertook specific work activities on the farm. These work-activity scenarios included: production of forage; cleaning the corral; construction of corral; purchase of dairy inputs; maintenance of corral; chopping forage at corral; cutting and carrying forage to animals; transport of milk to cooperative; bring cattle to pasture or water; estrus detection; cleaning of dairy utensils; record keeping; and receiving money from the milk.

**Exhibit 101** reports the gender breakdown for farm work activities in the matched sample. It shows a subtle shift, with women conducting typical male roles and men performing typical female activities. For instance, the activity of transporting milk to the cooperative was done by women in only 17 percent of the households at baseline, but at midterm the percentage increased to 23 percent. Similarly, at baseline a large proportion of male household members (65 percent) and a small proportion of females (7 percent) undertook construction of corrals. At midterm, the proportion of female household members undertaking corral construction increased to 12 percent, and the proportion for males declined to 58 percent. However, these differences are not statistically significant.

Small, yet statistically significant changes did emerge for other tasks. The typically female task of cleaning utensils saw a shift in female participation from 43 percent at baseline to 41 percent at midterm (significant at the 1 percent level). Record keeping, carried out by only 19 percent of women at baseline, increased significantly to 21 percent at midterm. Concomitantly, around 52 percent of men were responsible for record keeping at baseline; this proportion declined to 46 percent at midterm (significant at the 1 percent level).

In **Exhibit 102**, on work activities for the new midterm farmers, similar patterns emerge. For example, a large proportion of male household members (52 percent) and a small proportion of females (12 percent) undertook record keeping.

The qualitative data, in coordination with these quantitative data, suggest that traditional patriarchal norms continue to prevail in dairy cattle farming. In many cases, women performed the bulk of the day-to-day work in the dairy industry. Though they said they valued their participation, they did not receive fair income proportional to the work they performed. Furthermore, ownership and control of cows tended to rest with the household head, who was more likely to be male than female. However, as in decision-making, though the absolute numbers show a typical gender split, some changes do emerge when comparing baseline to midterm, showing an improvement at midterm in the assignment of typically male activities on the farm to women. The qualitative findings at midterm also revealed that women on farms took the lead in participating in the MERCADO project. They got the supplements from the cooperatives, delivered milk, and were primarily responsible for looking after the animals.

**Exhibit 101. Gender Breakdown of Farm Work Activities for Matched Sample**

| Work Activity                             | Male Adult Member |           | Female Adult Member |           |
|-------------------------------------------|-------------------|-----------|---------------------|-----------|
|                                           | Baseline          | Midterm   | Baseline            | Midterm   |
| Production of forage                      | 27.54%            | 32.14%    | 19.57%              | 19.29%    |
| Cleaning of corral                        | 25.26%            | 28.57%    | 25.36%              | 35.00%*   |
| Construction of corral                    | 65.22%            | 57.86%    | 7.25%               | 12.14%    |
| Purchase of dairy inputs                  | 68.12%            | 62.14%    | 22.46%              | 29.29%    |
| Maintenance of corral                     | 57.97%            | 63.57%    | 9.42%               | 12.86%    |
| Chopping forage at corral                 | 28.99%            | 35.00%    | 18.12%              | 22.86%    |
| Cutting and carrying forage to animals    | 28.26%            | 35.00%    | 14.49%              | 21.43%    |
| Transport of milk to cooperative          | 29.71%            | 31.43%    | 16.67%              | 22.86%    |
| Bringing cattle to pasture or water       | 3.62%             | 9.29%*    | 4.35%               | 4.29%**   |
| Estrus detection                          | 48.55%            | 62.86%**  | 28.99%              | 40.00%    |
| Cleaning of dairy utensils                | 18.12%            | 20.00%*** | 43.48%              | 40.71%*** |
| Record keeping                            | 52.17%            | 46.43%*** | 19.57%              | 20.71%*** |
| Receiving money from the milk cooperative | 52.17%            | 57.17%    | 32.61%              | 37.86%    |
| N                                         | 90                | 89        | 60                  | 53        |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who currently owned cows at the time of the survey and were matched from baseline to midterm. The Ns are the highest for each sample segment; the number of respondents varied for each decision-making scenario. The female and male columns do not add up to 100% because a few responses took other options like “farm employee” or “relative” and we did not ask gender for these options. Additionally, for responses at midterm, respondents could choose both “adult female” and “adult male”.*

**Exhibit 102. Gender Breakdown of Farm Work Activities for New Midterm Sample**

| Work Activity                             | Male Household Member | Female Household Member |
|-------------------------------------------|-----------------------|-------------------------|
| Production of forage                      | 35.71%                | 33.33%                  |
| Cleaning of corral                        | 35.71%                | 38.10%                  |
| Construction of corral                    | 59.52%                | 16.67%                  |
| Purchase of dairy inputs                  | 68.05%                | 33.33%                  |
| Maintenance of corral                     | 64.29%                | 19.05%                  |
| Chopping forage at corral                 | 38.10%                | 38.10%                  |
| Cutting and carrying forage to animals    | 40.48%                | 35.71%                  |
| Transport of milk to cooperative          | 38.10%                | 28.57%                  |
| Bringing cattle to pasture or water       | 9.52%                 | 14.29%                  |
| Estrus detection                          | 57.14%                | 42.86%                  |
| Cleaning of dairy utensils                | 16.67%                | 50.00%                  |
| Record keeping                            | 52.38%                | 11.90%                  |
| Receiving money from the milk cooperative | 54.76%                | 33.33%                  |
| N                                         | 27                    | 23                      |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who currently owned cows at the time of the survey and were new farmers at midterm. The Ns are the highest for each sample segment; the number of respondents varied for each work activity. The female and male columns do not add up to 100% because a few responses took other options like “farm employee” or “relative” and we did not ask gender for these options. Additionally, for responses at midterm, respondents could choose both “adult female” and “adult male”.*

## 6.4 Women’s Productivity and Challenges

Most farmers at midterm recognized that MERCADO has contributed to giving women a place in the dairy-producing community. Although they said that training provided crucial support, women who headed farms and cooperatives said that the project was not placing them into the private-sector-driven business model it promotes. As shown by the quantitative data in **Exhibit 103**, in the rainy season, both men and women see a decline in milk production, presumably because of Cyclone Idai. However, women farmers see an increase in the milk production from baseline to midterm in the dry season. Thus, women were more efficient and productive than male farmers in the dry season. However, although women were clearly more productive in terms of milk yields, women farmers said in focus groups that they felt disadvantaged because of their smaller herd sizes. Further, many find it hard to be efficient due to a lack of medicines and animal feed. Women farmers expressed the belief that, because they were increasingly the decision-makers and risk-takers in dairy farming, the project should treat them with a more business-oriented approach.

According to the paravets, women performed better in terms of rearing and caring for dairy cows. Women fed the cows and cleaned the corrals, but they had limited ability to transport milk and fodder. Paravets said that women needed appropriate means of transport and training on managing the milk system and the business. Paravets also mentioned that women farmers were relatively better educated than men were but lacked management training.<sup>70</sup> Women also mentioned facing resistance from spouses if they wanted to undertake new investments on the farms. Paravets confirmed the need for further investment

<sup>70</sup> The relatively higher education of women is also borne out in the quantitative data. Around 33 percent of female farmers compared to 26 percent of male farmers had completed primary first degree. Further, 23 percent of female farmers compared to 18 percent of male farmers had completed secondary first degree. Further, while the overall proportion of women receiving training is similar to men, a higher proportion of men receive certain types of trainings such as training on improved farming practices (67 percent men vs. 53 percent women) and improved farm management (48 percent men vs. 42 percent women). For other types of training such as training on improved dairy production and training on fodder production, a higher proportion of women receive these trainings.

in training for women. Although MERCADO did offer training for women, it did so infrequently. Paravets recommended implementation of frequent refresher courses.

Finally, as at baseline, the biggest challenge for women dairy farmers was lack of access to capital, according to farmer focus groups. Several factors, from high interest rates to burdensome application processes that disproportionately affect women, were likely to dissuade women from accessing credit with formal banking institutions. Farmers said that the project should try subcontracting DHF and DIF grants to a microlender and to village banking systems to increase women's access to credit and capital.

**Exhibit 103. Daily Yield of Milk Output per Cow for Men and Women (in Liters)**

| Farmer Characteristic         | Rainy Season Output |             | Dry Season Output |             |
|-------------------------------|---------------------|-------------|-------------------|-------------|
|                               | Baseline            | Midterm     | Baseline          | Midterm     |
| All farmers                   | 7.73 liters         | 6.62 liters | 7.61 liters       | 7.07 liters |
| <b>Gender<sup>1</sup></b>     |                     |             |                   |             |
| Female                        | 7.41 liters         | 6.72 liters | 5.86 liters       | 7.85 liters |
| Male                          | 7.41 liters         | 6.74 liters | 7.66 liters       | 6.63 liters |
| <b>Farm Scale<sup>2</sup></b> |                     |             |                   |             |
| Small                         | 8.13 liters         | 6.93 liters | 7.91 liters       | 7.19 liters |
| Medium                        | 4.21 liters         | 4.61 liters | 4.98 liters       | 6.72 liters |
| Large                         | 7.31 liters         | 3.13 liters | 7.56 liters       | 2.31 liters |
| N                             | 140                 | 59          | 140               | 64          |

\* $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

*Note: The sample is limited to farmers who identified at the time of the survey that they currently owned dairy cows. Farm scale is defined as the baseline level. The sample sizes differ between baseline and midterm because of different rates of non-response.*

<sup>1</sup> Gender is defined as the gender of the respondent at baseline and if the respondent self-identified as the head of the household at baseline.

<sup>2</sup> Since there is only one large farmer from baseline who matched to midterm, a comparison is not meaningful.



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## SECTION 7. CONCLUSIONS AND RECOMMENDATIONS

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In this report, IMPAQ documents the state at midterm of key dairy value chain actors who are MERCADO project beneficiaries; establishes project midterm values; provides recommendations; and, finally, generates data for comparative analysis for the final evaluation of the project.

At midterm, the IMPAQ team collected extensive qualitative and quantitative data from a broad population of dairy value-chain actors. Our mixed-methods approach frames the midterm evaluation through the lens of Mozambique's dairy market system, considering how MERCADO's interventions contribute to the development of a sustainable private-sector-driven dairy market system. Our inquiries at various levels of the value chain paint a broad picture of MERCADO's relevance, impact, effectiveness, efficiency, sustainability, and gender equity.

The team collected quantitative data through an extensive survey with 285 dairy farmers. We complemented these quantitative data with qualitative data collected from farmers in focus group discussions. We also conducted semi-structured surveys with other value-chain actors: cooperatives, processors (including microprocessors), and a breeder. These semi-structured surveys included both quantitative and qualitative questions. In addition, we conducted key informant interviews with stakeholders including paravets, lecturers, student interns, government representatives, and project staff and partners. Thus, the midterm evaluation has established a strong basis for the final evaluation by providing comprehensive documentation of the state of the Beira corridor's dairy market system.

We structure the remainder of this section as follows. **Section 7.1** synthesizes the major analytical results from the midterm data collection. **Section 7.2** presents preliminary findings on how the midterm evaluation answered the project's evaluation questions related to the project's relevance, impacts, effectiveness, efficiency, sustainability, and gender equity. **Section 7.3** lists the limitations of the evaluation, and finally, **Section 7.4** provides recommendations for the MERCADO project based on the midterm findings.

### 7.1 Summary of Findings

We summarize our findings from dairy farmer, cooperatives, processor, and breeder, and all additional stakeholders below.

#### 7.1.1 Dairy Farmers

The main objective of the midterm quantitative data collection for dairy farmers was to provide information on herd composition, production practices, animal health services, volume and value of milk production and sales, engagement with MERCADO, and impacts of Cyclone Idai. We present below a summary of our findings.

##### *Herd Size and Production Practices*

- The proportion of medium-scale farmers (with four to 19 cows) increased from 6 percent at baseline to 13 percent at midterm.
- The proportion of small farmers who gave fodder to their cattle declined significantly from 94 percent at baseline to 79 percent at midterm.
- The proportion of small-scale farmers who had continuous access to water increased significantly from around 2 percent at baseline to 15 percent at midterm.
- No significant change emerged in the proportion of farmers using milking machines from baseline to midterm.

- We did not observe a significant change in the use of AI from baseline to midterm. The proportion of farmers using private veterinarians and livestock technicians for AI increased, while the proportion using Venture37 declined.
- As at baseline, more than 90 percent of farmers at midterm reported giving their cattle supplements. However, the types of supplements farmers used at midterm, including wheat bran and mineral blocks, among others, significantly increased.
- For key inputs like grazing and supplements, ease of access significantly declined from baseline to midterm for small farmers.
- More than 58 percent of medium-scale farmers at midterm used milk-chilling equipment. Both large farmers also used milk-chilling equipment. The most common source for replacement of milk chilling equipment was Venture37.

### ***Animal Health Services***

- The proportion of farmers who conducted animal health testing from baseline increased, though the difference is not significant. There was a significant increase in use of testing for diseases such as brucellosis.
- There was a marginally significant increase in the proportion of small-scale farmers who vaccinated their cows, from 75 percent at baseline to 84 percent at midterm.
- The proportion of small farmers who withdrew their milk from sale or consumption after using antibiotics increased significantly from 22 percent at baseline to 60 percent at midterm.
- Small-scale farmers reported a non-significant increase in ease of access to health services, with those reporting that access was easy or very easy increasing from 39 percent at baseline to 48 percent at midterm.

### ***Engagement with MERCADO***

- The most common type of engagement with MERCADO for farmers of all types was training provided by the project.
- Farmers started adopting better housing practices based on their experience with the MERCADO project. More than 65 percent of small- and medium-scale farmers started keeping a feeder or food receptacle in the corral based on their experience with the MERCADO project.
- Even though Venture37 has scaled back its focus on zero-grazing, awareness of this scale-back is low. More than 60 percent of small- and medium-scale farmers had adopted zero-grazing based on their experience with the MERCADO project.

### ***Production, Disposition, and Revenue***

- There was a general decline in the daily milk production per cow for all categories of farmers from baseline to midterm for all the subgroups in our analysis. Cows produced on average 7.73 liters of milk per day at baseline and 6.62 liters per day at midterm for the rainy season. In the dry season, the daily milk production per cow declined from 7.61 liters per cow to 7.07 liters per cow.
- For the matched sample, the daily volume of milk sales in the rainy season declined from 7.94 liters at baseline to 7.09 liters at midterm, but this reduction was not statistically significant.
- For the matched sample, the average daily volume of milk sales for the dry season shows a decline from baseline to midterm but the change is not statistically significant.
- Matched small-scale farmers reported a statistically significant decline in the percentage of milk they retained for consumption by calves between baseline and midterm in both rainy and dry seasons, from around 20 percent to around 10 percent. Small farmers also saw a significant increase in the share of milk sold to cooperatives in both seasons. This went from around 55 percent at baseline to around 85 percent at midterm. Medium-scale farmers saw no significant changes in milk utilization.

- The number of times matched small-scale farmers had their milk rejected decreased significantly from 4.7 times on average at baseline to 2.3 times on average at midterm. Rejections for medium-scale farmers show a decline of more than 75 percentage points, but the change is not statistically significant due to the small sample size. This finding suggests an overall reduction in the frequency of milk rejection between baseline and midterm for matched farmers.

### ***Effects of Cyclone Idai***

- Around 11 percent of small-scale farmers in the entire midterm sample lost cattle due to Cyclone Idai. The average number of cattle lost by small farmers due to Idai was two.
- Almost 30 percent of small-scale farmers reported reduced milk production on average of about 4 liters per cow per day due to Cyclone Idai. Over 60 percent of medium-scale farmers reported decreased milk production on average of about 10 liters per cow per day.
- About 11 percent of small-scale farmers and about 13 percent of medium-scale farmers reported lower sale prices for milk. Most farmers reported no effect on prices.
- The most universal piece of dairy infrastructure affected by the cyclone was the housing for dairy cattle. The cyclone also caused problems in accessibility of various inputs due to a variety of reasons, including damaged public infrastructure and local markets, with almost half of small-scale farmers saying it was more difficult to access inputs.

### **7.1.2 Cooperatives, Processors, and Breeders**

The main objectives of the midterm data collection for cooperatives, processors, and breeders was to provide information on procurement and processing of milk and milk products, production practices, volume and value of milk production and sales, breeding practices, engagement with MERCADO, and impacts of Cyclone Idai.

#### ***Engagement with MERCADO***

- Most firms believed that the project increased the visibility of the actors of the dairy value chain, which is motivating for many of the cooperatives' members and processors.
- Although most firms increased their output during the MERCADO project, all of them expressed concerns around breaking even and not being able to balance costs and revenues.
- Most businesses reported that MERCADO was active in providing training. However, most agreed more training was necessary in the area of sales and marketing, which was key for them to increase sales.
- The grants for co-financing acquisition of dairy infrastructure and cows were key motivators for firms to participate in the project.

#### ***Procurement of Milk and Breeding***

- On average, the cooperatives procured 17,391 liters of raw milk over the entire rainy season with a value of USD 5,570, while in the dry season the average procurement by cooperatives was significantly higher, at 26,007 liters valuing USD 9,520.
- On average, the processors (excluding the largest processor) procured a little over 9,500 liters of raw milk in the rainy season and 10,500 liters in the dry season valued at USD 3,365 in the rainy season and USD 3,953 in the dry season. The largest processor procured 368,842 liters of raw milk — more than 30 times the average for the other processors in our sample. The value is also consequently much higher: USD 116,749.
- The average price per liter of milk procured by cooperatives and processors was similar in both seasons.
- The one breeder in the sample used AI to produce cattle for sale.

### ***Processing of Milk***

- On average, processors had a processing capacity of 31,200 liters in the rainy season and about the same (30,000 liters) in the dry season.
- Because they procured more milk in the dry season, processors also processed more milk in the dry season: 9,375 liters as compared to 8,680 liters in the rainy season.
- Firms tended to over-report their utilization of their processing capacity.

### ***Sales of Milk and Milk Products***

- For processors, in both seasons, the most common buyers were consumers. Processors operated on a much larger scale than cooperatives.
- The average volume of milk and milk products sold by processors was 7,156 liters in the rainy season and 7,375 liters in the dry season. The number for cooperatives is lower at 24,475 liters in the dry season and 16,173 liters in the rainy season.
- The volume of sales for both cooperatives and processors was higher in the dry season than in the rainy season, with correspondingly higher average values of sales.
- There was no seasonal difference in the average price per liter of raw milk sold for cooperatives and processors.

### ***Milk Quality Testing***

- Quality checks and instruments varied among the cooperatives and processors in the sample, with few universal practices beyond the most fundamental. Testing for mastitis, acidity, and freshness were the most common quality checks.

### ***Challenges***

- Incomplete and broken links in the supply chain were the main concern for cooperatives and microprocessors. Infrastructural bottlenecks, such as poor transportation conditions, were the major challenges in buying and selling milk and milk products.
- The low prices processors received for milk and milk products made expansion difficult for small processors. Respondents felt that the best strategy would be to connect smaller and mid-sized players to a secure sales channel.
- Cooperatives, which receive only USD 0.31 per liter of milk on average, have started selling directly to consumers and public institutions like schools to remain viable.
- Cooperatives and processors suffered due to Cyclone Idai. A majority of both firm types reported reduced milk procurement, with processors revealing significant losses. The cyclone's damage to roads, grazing fields, and other dairy infrastructure all served to weaken the supply chain.

### **7.1.3 Additional Stakeholders**

The main purpose of our qualitative data collection with additional stakeholders was to provide information from important participants in the dairy value chain. These stakeholders include paravets, lecturers at educational institutions, student interns, and government stakeholders at the national and provincial levels. In addition, interviews with project staff and partners provided important contextual information around project strategy and rollout.

#### ***Paravets***

- Paravets played an important role in providing training and medical assistance to the small farmers.
- Some farmers were unable to benefit from the training, due to lack of capacity and resources. Other farmers did not fully process the trainings and reverted to using outdated practices. Paravets believed that farmers were more likely to apply practices when they attended hands-on,

practical trainings held at local farms rather than at the cooperatives. They also believed that continual and refresher training were beneficial to farmers retaining knowledge.

- The paravets expressed the belief that the single most important subject for the dairy farmers is animal nutrition. Farmers did not fully understand the nutrition balance or the amount of feed Jersey cows need to maximize milk production.
- Like other beneficiaries and in line with key MERCADO strategy, paravets said that farms must have at least four cows to be sustainable.
- Paravets were motivated to help farmers and promote the dairy industry. They were discouraged by the fact that farmers were generally unable to pay for their services, by having to travel long distances without reliable transportation, and by inadequate medical supplies.

### ***Lecturers***

- The lecturers appreciated the MERCADO curriculum. Both noted the importance of hands-on opportunities for their students to practice with livestock.
- Lecturers saw a lot of opportunity for their students in the dairy industry. They said that the internship program was very popular and encouraged students to enter the dairy sector. They highlighted the limited availability of funds through local microfinance banks for students to start dairy businesses after graduation. Lecturers suggested that MERCADO invest in something similar, providing entrepreneurial students with three or four cows to start farming.
- Lecturers suggested creating an activity to help the schools directly support farmers in following best practices in nutrition and animal health.
- Lecturers requested additional professional development and exchange of teachers, as they believed they still had much to learn.

### ***Student Interns***

- Generally, the students were very happy with their internships and were enthusiastic about starting a career in dairy. Many students were interested in farming, but others were interested in milk processing, veterinary services, and business or marketing.
- Students liked working on the farms with extensionists, as they could see firsthand what farmers were doing correctly and improvements they could make. They said they preferred learning through hands-on work rather than theoretical classroom training.
- Many students were critical of what they saw in the field. They expressed the belief that the current system of buying fodder was not economically sustainable for the dairy farmers. They also saw many farmers not using medicine correctly or not properly taking care of their animals. They wanted Venture37 to address the fact that they saw project-supported farmers poorly caring for their animals.

### ***Government Representatives***

- At the national level, the Mozambican government is highly invested in developing a modern dairy sector. The government is developing several regulations to standardize the industry with the support of Venture37, including requirements around animal health, feed formulation, regulation of medicine, and manufacturing practices. Several of these regulations have already been approved by DINAV, specifically (1) Livestock Feed Regulation; (2) Regulation on Raw Milk Collection, Refrigeration and Bulk Transport; and (3) Livestock Health Legislation. The government is also creating for the first time a national dairy development strategy to guide their work prioritizing the industry.
- Provincial government is also highly invested in the dairy sector. Through creating dairy focal points, they coordinate the various actors, including processors, cooperatives, and educational

institutions. They said they would commit to diversifying the market by supporting other buyers in addition to the current large processors.

### ***Project Implementers (Venture37 Project Staff and Partners)***

- Project staff fully realize that in order to build a viable dairy value chain in the Beira corridor, small farmers with one to two cows are not sustainable. This knowledge informed the design and approach of MERCADO, as the project is investing in a smaller number of motivated farmers in order to increase farm sizes and increase milk production per cow.
- Even with several unforeseen challenges (Cyclone Idai, foot-and-mouth-disease, market fluctuations), project staff and partners are optimistic that they are laying the foundation for a strong and growing industry.

## **7.2 Main Research Questions**

The midterm assessment aimed in part to provide information on the project's evaluation questions related to the project's relevance, impacts, effectiveness, sustainability, and gender equality and equity.

### **7.2.1 Relevance**

To capture the relevance of MERCADO for addressing the dairy sector needs, we consider: 1) the suitability of the project to the realities and requirements of the dairy sector in Mozambique, and 2) the alignment of MERCADO activities and strategies with government priorities and policies. We discuss each of these in turn below.

### ***Sustainability of Project Design and Activities***

- The results framework and project design are highly ambitious, particularly given the poverty, low education, and lack of infrastructure in Manica and Sofala provinces. Although many project beneficiaries were motivated to enter the sector, dairy farming is an incredibly challenging and high-risk endeavor. Without sufficient support, farmers may end up worse off than they were before the project; for example, some have invested in cows that have not reached their full production potential or have died. Some said they were demoralized by not seeing a return on their investment, and some reported that other farmers stopped dairy farming altogether.
- Although they were grateful for project support, farmers and cooperative leaders felt that MERCADO did not consider their needs in the project design, particularly in relation to the DIF. They would like Venture37 to coordinate with them in decision-making around funds allocation. They also would like to coordinate with Venture37 to plan training, activities, and project requirements, as they can provide information on appropriateness and relevance.

### ***Alignment of MERCADO Activities***

- The strategy of MERCADO aligns with the priorities of the government of Mozambique. The national government appreciates the support from Venture37 in developing the fledgling industry.

### 7.2.2 Impacts

We outline below the main impacts of the MERCADO project on: 1) farm scale and commercial viability, 2) knowledge and uptake of improved agricultural practices, 3) profitability and sales, 4) safety and quality, and 5) herd composition, production, and sales due to Cyclone Idai.<sup>71</sup>

#### ***Impact on Farm Scale and Commercial Viability***

- The total number of project beneficiaries declined from baseline to midterm. This reduction in the number of beneficiaries is in line with a major goal of MERCADO – to focus project activities on a fewer number of farmers who show a greater interest and capacity to eventually grow into medium- or large-scale farmers, thus ensuring a greater chance of sustainability after Venture37 no longer provides support.
- Among project beneficiaries who were present at both baseline and midterm, impact on scale for medium-scale farmers was promising. The proportion of medium-scale farmers increased from 6 percent at baseline to 13 percent at midterm. In line with MERCADO's goal, the best medium-scale farmers ("grantees") were prioritized with grants under the DHF in the last 12 months. Many small farmers are still being processed under the DHF to receive cattle due to supply side problems in the last 12 months including border closures due to foot and mouth disease in Mozambique.

#### ***Impact on Knowledge and Uptake of Improved Agricultural and Management Practices***

- There has been an improvement in animal health testing for small farmers with more farmers testing for common diseases like brucellosis and mastitis than at baseline.
- Practices related to milking did not see a significant change from baseline to midterm. For instance, similar proportions of farmers used milking machines and stainless steel buckets in both rounds. There was a significant improvement in respondents citing Venture37 as a potential source for replacement for both milking machines and stainless steel buckets.
- More than half of medium-scale farmers at midterm used milk-chilling equipment. The most common source for replacement of milk chilling equipment was Venture37.
- In terms of grazing practices, there was a decline in zero-grazing. This is part of Land O'Lakes wider strategy of helping farmers find the most suitable grazing practice for their herd, as opposed to only promoting zero-grazing.
- There was a decline in the proportion of farmers giving their cattle feed, potentially because buying feed from the market is expensive. This was also borne out in the qualitative focus groups, where farmers expressed the desire to grow their own feed because of the high cost of feed.
- The two areas in which small farmers had high levels of knowledge were mastitis testing and milk quality and testing, which ties in with the results outlined above about improvements in animal health testing.
- Small farmers showed lower awareness in some improved dairy practices, such as ways to improve pasture quality and advantages of artificial insemination (AI), at midterm than at baseline. Possible reasons for low knowledge as highlighted in our qualitative interviews were lack of motivation, lack of continuous training and lack of regular use of these methods, especially AI. As small farmers are not very well connected, they do not have many opportunities to learn about new practices and mostly rely on the training provided to them.

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<sup>71</sup> As mentioned before, we refer to *impact* here as relevant to the evaluation questions of the Development Assistance Committee of the Economic Cooperation and Development (OECD-DAC). That is, since we did not have a comparison group, the use of *impact* does not denote any causation as used in the report and we are unable to causally attribute changes to the MERCADO project.



- While ease of access to health services improved significantly from baseline to midterm for small farmers, ease of access in other cases such as fodder, supplements, and breeding services, declined. As reported by farmers in the farmer survey, many are now seeking private providers for these inputs. This is in line with Venture37's sustainability strategy wherein many farmers are now turning away from Venture37 as the main input supplier and relying more on private players, as was reflected in the farmer survey data.

### ***Impact on Production and Milk Sales***

- The daily volume of milk produced per cow decreased slightly, but not significantly, from baseline to midterm in both the rainy and dry seasons.
- The volume of sales made by all farmers also saw a slight decline overall from baseline to midterm. However, female farmers saw an increase in volume of sales in both the dry and rainy seasons from baseline to midterm. Small farmers saw an increase in volume of milk sales in the dry season. The value of milk sales followed a similar trend, with a slight overall decrease in sale value and increases in the dry and rainy seasons for female farmers and in the dry season for small farmers. These results suggest that MERCADO is providing greater benefits for the more vulnerable small-scale farmer and female farmer subgroups.
- Small-scale farmers retained significantly less milk for consumption by calves at midterm than at baseline. Instead, they significantly increased the share sold to cooperatives, across both dry and rainy seasons. There was no significant change in the amount of milk retained for own consumption in both the dry and rainy season.
- Most cooperatives and processors reported an increase in milk procurement due to their engagement with MERCADO, though the increase was not enough to enable them to break even.
- Similarly, over 80 percent of both cooperatives and processors said that their milk sales increased due to the project. However, they continued to cite low sales volumes as a binding constraint on profitability and expansion. Low sales volumes are due to low production volumes by farmers; transportation constraints in procurement in the rainy season.

### ***Impact on Safety and Quality***

- Midterm results on quality assurance practices were very positive.
- Farmers seemed more aware of the dangers of consuming milk from cows treated with injectable antibiotics. There was a significant reduction in the frequency of rejection of small farmers' milk for quality reasons. These trends suggest a transition to more quality assurance in the dairy industry.
- The quality checks and instruments used by cooperatives and processors varied. The most common quality checks were tests for mastitis, acidity level, and freshness.

### ***Impact of Cyclone Idai***

- Cyclone Idai had a devastating impact across the dairy value chain. A smaller share of small-scale farmers than medium-scale farmers lost cows due to the cyclone.
- Small-scale farmers faced a higher sickness rate after the cyclone. As a result, milk production fell.
- Unsurprisingly, housing for cattle was the dairy infrastructure most damaged by the cyclone. Damage to infrastructure generally made dairy inputs more difficult to access, though some farmers said there was no change after Cyclone Idai.
- Cooperatives and processors reported reduced milk procurement after the cyclone, with processors revealing significant losses. The damage to roads, grazing fields, and dairy infrastructure all served to weaken the supply chain, resulting in the observed procurement losses.

### 7.2.3 Effectiveness

In examining the effectiveness of MERCADO project activities at the midterm of the intervention, we examined the following two topic areas: 1) extent to which project targets and outcomes are likely to be achieved by the end of the project, and 2) key successes that should be replicated or key improvements needed for implementation to maximize the results. We discuss each of these below:

#### ***Extent to Which Project Targets and Outcomes are Likely to be Achieved***

- One of the main objectives of MERCADO is to increase the use of improved agricultural techniques and technologies. This objective includes increasing availability of and access to improved inputs and increasing knowledge of improved techniques.
- Access to improved inputs significantly declined from baseline to midterm. Specifically, access to grazing, supplements, and AI services declined. Use of key inputs including fodder declined or stayed the same.
- Milk production and milk sales declined or stayed the same from baseline to midterm.
- For cooperatives and processors, business viability remains a major concern. Large processors have a monopoly over price, while smaller microprocessors are struggling to break even.

#### ***Key Successes and Areas for Improvements***

Based on the quantitative and qualitative findings, to achieve project targets by the final evaluation, key successes should be strengthened and significant improvements made.

- Key successes include the following: 1) Students and farmers embracing student internships, 2) increased awareness about milk testing and the importance of ensuring quality among farmers, cooperatives, and processors, and 3) indication of a change in traditional gender roles with some women taking on typically male tasks like transporting milk and record keeping.
- Key areas for improvement include: 1) focusing on animal health and nutrition, 2) increasing ease of access to key dairy inputs, 3) increasing ease of access to dairy collection points, 4) wider dissemination of the scaling back of Venture37's zero-grazing policy and outlining other grazing options for farmers, and 5) increasing training in marketing and sales for cooperatives and microprocessors.

### 7.2.4 Efficiency

To analyze the extent to which MERCADO is efficient, we explore: 1) the timeliness of project resources and activities and 2) the use of monitoring and evaluation data to make programmatic decisions.

#### ***Timeliness of Project Resources and Activities***

- Several external factors that affected the timing of several project activities. Some of these factors included a delay in distributing cattle through the DHF due to an outbreak of foot-and-mouth disease, and the delay or redistribution of resources due to Cyclone Idai.

#### ***Use of Monitoring and Evaluation Data***

- Project staff reported that they used monitoring and evaluation data not only for reporting purposes, but also to provide formative information for the implementers to adjust their coaching and delivery with beneficiaries in the field.
- One potential challenge to effectively using project monitoring and evaluation data is the fear by project staff that some farmers are underreporting their milk production to cover the fact that they are side-selling instead of selling all of their milk to the cooperatives.

### 7.2.5 Sustainability

To analyze the extent to which MERCADO is sustainable, we explore: 1) which benefits and activities are likely to continue even after the project ends, 2) the exit strategy to ensure sustainability, and 3) the reduction or elimination of ineffective activities and practices. We discuss each of these in turn:

#### ***Sustainable Benefits and Activities***

- The equipment and infrastructure improvements financed through the DIF are likely to benefit many farmers and service providers for several years past the end of the project. Examples include corral improvements, stainless steel containers, milking machines, milk tanks, and pasteurizers.
- The knowledge gained through MERCADO trainings around post-harvest handling appears to support the sustainability of safety and quality in the dairy value chain.
- The improved curriculum for the educational institutions and the well-received internship program show promise for engaging an enthusiastic and educated new generation of farmers in the Beira corridor.
- The commitment of the national government in Mozambique is a crucial element in strengthening the dairy industry. Regulations around livestock feed, raw milk collection, refrigeration and bulk transport, and livestock health are key to ensuring the modernization and competitiveness of the Mozambican dairy sector.
- Generally, the small farmers in this project are poor. Promoting resource-intensive practices such as zero-grazing and use of expensive imported feed will not be successful. MERCADO should continue to scale down zero-grazing through wider dissemination and instead consider focusing on more realistic and appropriate practices, such as teaching farmers to cultivate their own fodder.

#### ***Exit Strategy***

At the time of midterm data collection, the beneficiaries were heavily dependent on Venture37, and it would be a shock to the entire dairy value chain in the Beira corridor if the project were to end suddenly. Many beneficiaries experienced disruptions when the previous project ended in 2016. Currently MERCADO has a six-fold exit strategy as outlined in the “Proposal for MERCADO Submission to USDA”. Below we present the main elements of the exit strategy and our recommendations for modification of this exit strategy based on the midterm results are detailed below:

- An important element of MERCADO’s current exit strategy as laid out in the “Proposal for MERCADO Submission to USDA” is that financial institutions will have an expanded set of borrowers and savers to target specific products. The project will help these institutions deliver products and services that will be accessible and create a profit opportunity for both financial institution as well as for the farmer or small-medium enterprise borrower. However, at midterm, the DIF grants through MERCADO continue to dominate the financial landscape. Project beneficiaries outlined that obtaining credit from other sources was extremely difficult. In this context, in order to achieve this exit strategy, we recommend transitioning the DHF and DIF into a facility managed by banks and microfinance institutions. This would involve leveraging existing microfinance institutions in the area and transitioning the DHF and DIF to them for the remainder of the project period. This will develop trust between project participants and these local banks and microfinance institutions. This will be crucial for future lending prospects of project beneficiaries’ post-MERCADO. Further, the project should continue to reach out to local agribusinesses and agricultural lending institutions in the area including Agricultural Development Fund (FDA), District Development Funds (FDD), Agriculture Promotion Centre (CEPAGRI), Cabinet

for Promotion of Investment (CAPI), and encourage them to provide input credit and short-term loans to project beneficiaries.

- Co-investment in private sector providers of inputs such as feed and mini-agribusinesses to produce fodder/forage is another important element of current exit strategy of MERCADO. To meet this element of exit strategy, we recommend immediately identifying commercial retail sector players such as agro-vets and agro-dealers to begin handling feed thereby expanding the distribution network of animal feed. To encourage private players to enter the market, we recommend working with the provincial governments to facilitate tax breaks and other incentives for these private agri-businesses. This can be an extension to the current policy work being done by the MERCADO project. Finally, we also recommend encouraging local commercial mills to collaborate with universities and encouraging them to develop affordable concentrate feed.
- Finally, one of the core exit strategies of MERCADO is to reduce cattle importation to grow herd sizes. Currently, as reported in the farmer survey data, scale of operation in dairy farming is still low with small farmers forming the bulk of project beneficiaries. This component of the exit strategy is focused towards creating commercial breeding farms to support the needs of dairy farmers. However, as of now, only one commercial breeding farm that has been set up. Further, qualitative interviews with this farm revealed that dairy farmers will be unable to buy cows from them in the future after the project ends because of financial constraints. Consequently, we recommend continuing to focus on promoting natural breeding amongst project beneficiaries by increasing their access to credit and encouraging farmers to put in DIF requests for crossbred bulls so that each individual farmer can breed on their own farm.

### ***Scaling Down of Activities***

To compensate for the reduction in monetization proceeds, Venture37 requested that the evaluation team examine activities or practices that could be reduced/eliminated without significantly impacting the project. The project should make targeted investments focusing on ensuring results. To this end, activities should scale down activities related to the dairy demand campaign and transfer quality trainings to large milk processors. Concomitantly, the project should narrow focus on practices to promote animal health and nutrition and links to fair market prices, which are the cornerstone of sustainability. Specifically, we recommend the following:

- It appears from the data that farmers had an improved understanding of milk quality, and it is promising that milk rejection rates are lower than at baseline. In this context, we recommend scaling down continuous trainings around milk quality and instead dedicating project resources for refresher trainings on milk quality. Further, we recommend transferring these trainings to large processors and encouraging them to invest in these trainings as part of Venture37's long-term sustainability strategy. This would also be in the interest of the large processors since by investing in periodic trainings they would get higher quality milk which would increase their sales volumes and hence revenues.
- Farmers also showed that they understand how to prevent or control mastitis. Further, testing for mastitis also increased at midterm. However, these same farmers reported an increase in the incidence of mastitis and other diseases, potentially due to Cyclone Idia. This indicates that they have appropriate knowledge and regularly test for mastitis, but are unable to protect their cows from mastitis during external shocks. In this context, we recommend limiting training on *testing for mastitis* and instead focusing on *preventative steps* that can be taken to limit the incidence of mastitis in the immediate aftermath of an external shock like a flood. This is particularly

important because paravets said that farmers were unable to discern when their animals are unhealthy until it is too late. Promoting preventative practices may be cost-effective, as the cost of inputs to keep animals healthy may be less than the cost of caring for sick animals and can keep farmers from losing cows to disease or malnutrition.

- Through our quantitative surveys, we found that the main constraint on the demand side is not that there is low demand for Mozambican milk, but that there is not sufficient supply to meet the demand. This was also revealed in the Special Study on “Assessment of Opportunities for Alternative Aggregation Models for Dairy Industry Growth in Mozambique”, wherein it was found that demand continues to outstrip supply, which increased the reliance on imported products.<sup>1</sup> Thus, we recommend scaling down the dairy demand campaign and instead focusing on the supply side. This includes three components. First, shifting focus towards the packaging, marketing, and branding of local milk and milk products as these are major barriers for local processors. Second, this will entail continuing to increase milk production by transitioning more small farmers to medium-scale through the DHF to meet the high demand for milk. Finally, we recommend continuing to increase the milk processing capacity of microprocessors by continuing to give them DIF grants to help grow their business.

### **7.2.6 Gender Equality and Equity**

To analyze the extent to which MERCADO has been able to improve gender equality and equity we focus on two main questions: 1) extent to which the project ensured participation by women and 2) extent to which outcomes differed between men and women. We discuss each of these in turn:

#### ***Participation of Women***

- Only a third of all project participants in both provinces were female, with female participation being slightly higher in Manica than in Sofala.
- Women farmers had not become major stakeholders in the MERCADO project, despite a widely expressed belief by paravets and processors that women are more efficient farmers.
- Even among women involved in the MERCADO project, the scale of operations was small compared to that of men.

#### ***Outcomes for Men and Women***

- From baseline to midterm, data show an increase in decision-making for women, especially when it comes to allocation of crop income and distribution of household activities. Further, women increased their role in the small dairy farms from baseline to midterm.
- Women farmers consistently produced more milk per cow than male farmers did in the dry season. Paravets also mentioned the higher productivity and efficiency of women-owned farms.
- At midterm as at baseline, the biggest challenge women had in experiencing success in the dairy sector was lack of access to capital.

### **7.3 Limitations**

We note below a few limitations of the study that may be relevant to the findings in this midterm report.

#### ***Concurrent Collection of Qualitative and Quantitative Data***

One limitation of the evaluation was the simultaneous collection of quantitative and qualitative data. This led to several instances wherein verification of quantitative findings with follow-up qualitative questions, especially for the farmer survey, was not possible. One example of this is the seasonal differences in milk production (see **Section 3.5.1**) which we were unable to explore through our focus group discussions and

key informant interviews with farmers and other local stakeholders who could have potentially explained the reasons for our findings.

### ***Small Sample Sizes***

In many cases, sample sizes for outcomes disaggregated by farm scale in the farmer survey are very small, especially for large farmers ( $N < 5$ ). The number of medium-scale farmers is also low ( $N < 20$ ). For cooperatives and processors, the sample sizes are five and eight, respectively. Finally, there was one breeder surveyed (because it's the only one involved in the project). Additionally, in many cases these few respondents did not answer important questions like milk production, milk procurement, and sales. Thus, findings from these small sample sizes are unreliable and we caution against drawing any definitive conclusions.

### ***Changes in Data Collection Instruments from Baseline to Midterm***

As described in greater detail in **ANNEX G**, the farmer survey and semi-structured surveys for cooperatives and processors were different at midterm compared to baseline. At the request of Venture37, we added questions to the surveys to provide additional monitoring data and to capture information about project activities such as record keeping and engagement with MERCADO. Additionally, at the request of Venture37, we edited the wording of several questions to improve clarity. The slight discrepancy in how questions were asked is a limitation, as respondents could have interpreted the questions differently at baseline and midterm based on these changes. This also led to comparability issues especially for the cooperative and processor semi-structured surveys, wherein only key performance indicators could be reported for both baseline and midterm.

### ***Reliance on Self-Reported Data***

Another limitation of this evaluation is that we are reliant on self-reported data, which often includes socially desirable answers. For example, farmers could have under reported how much milk they sold in the informal market. The self-reported data on milk production and utilization could also be incorrect, as many farmers relied on their memory, best estimates, or incomplete record books to answer very specific questions on the liters of milk produced daily in each season.

### ***Inability to Attribute Causation***

Finally, a main limitation of this evaluation is that the design does not allow us to do a causal assessment of the MERCADO project. Given that MERCADO essentially works with all dairy farmers in the Beira corridor, an experimental or quasi-experimental design was not feasible. Therefore, any outcomes cannot necessarily be attributed to the project, although they can provide an indication of change.

## **7.4 Recommendations**

The recommendations to Venture37, based on lessons learned in the field and findings from the midterm data, fall into three parts:

- **Quick wins** are cost-effective recommendations for relatively simple problems. We suggest immediate implementation of these strategies to yield maximum effect.
- **Medium-effort items** require a modified evaluation budget and scope of work but are less time- and cost-intensive than long-term strategies. Medium-effort recommendations are important to consider for bridge or future projects.
- **Long-term strategy recommendations** may require more time, effort, and cost to implement.



### 7.4.1 Quick Wins

- **Provide training on strategies to help women-owned farms succeed.** Although women farmers had higher milk production than men, they indicated they were at a disadvantage because of their small herd sizes. Even as women are increasingly becoming the decision-makers and risk-takers in dairy farms, access to credit and capital is still a big constraint for them. Given that there is no specific women centered approach as of now, we recommend that Venture37 *specifically* target women with trainings to help them overcome the constraints they face and become more commercial by expanding operations and adopting improved business practices. This could include targeting DIF grants to women. Further, the project could also sponsor gender-sensitivity trainings to show male partners how to support female farmers.
- **Continue MERCADO's policy work and increase focus on implementation.** MERCADO has been doing extensive policy work including facilitating a national dairy development strategy, forming a national dairy representative body, and developing appropriate dairy related legislations and regulations. As the project moves towards its final phase, we recommend that MERCADO should continue to work with the Mozambican government in strengthening regulatory frameworks around feed, medicine, and animal health. Given the nascent state of the dairy industry in Mozambique, especially the policy frameworks, this is extremely important. Additionally, we also recommend initiatives towards implementation and enforcement of these policies at the local level. These could include encouraging collaboration between the government and the educational institutions that Venture37 is working with to discuss mechanisms for better on-the ground implementation of these policies. Further, we recommend encouraging collaboration with different ministries and departments within the government since they often have crosscutting mandates and interests, which are important for proper implementation. Finally, we recommend wide discussion of the policy measures being undertaken in the dairy industry at Dairy Focal Points to promote awareness among various stakeholders.
- **Continue to promote wider awareness of various grazing options.** Even though Venture37 scaled back its zero-grazing policy, many small- and medium-scale farmers at midterm continued to practice zero-grazing. This finding is particularly worrying because fodder use was also declining. Farmers who are still practicing zero-grazing but do not have the means to buy fodder are not able to give their cows adequate nutrition. We recommend putting additional effort to make all farmers aware of the scaling back of the zero-grazing policy through paravets and project staff. Additionally, these informants should also offer information on other alternative grazing practices promoted by Venture37 such as “semi-grazing” and growing one’s own fodder.
- **Increase transparency of the Dairy Innovation Fund (DIF) and the Dairy Herd Fund (DHF).** Most stakeholders, from farmers to cooperatives and microprocessors, appreciated the DIF and DHF and reported that it is a very valuable project intervention. Project staff explained that the procedure for administering grants is advertised nationally through cooperatives and introductory meetings. However, some respondents indicated that distribution of DIF and DHF funds is not transparent. We recommend making the DIF and DHF grant process more transparent by frequently advertising the selection process for acceptance of applications and disseminating these criteria widely throughout the project period and not just at project launch.
- **Involve smaller beneficiaries and stakeholders in the implementation of project activities.** The main beneficiaries of the project – small farmers and cooperatives – expressed the feeling that they do not get a full seat at the table. Smaller farmers expressed the desire to coordinate with



Venture37 in determining which activities are offered and how. As the project moves into its final phase, we suggest including farmers' associations and cooperative members so that smaller farmers can provide valuable information on their needs and needs of their community after MERCADO ends. Since the eventual goal of the project is to transition these small farmers into medium-scale and thereafter focus on medium-scale farmers, it is important to involve them in the planning and implementation stages.

#### 7.4.2 Medium-term Strategy

- **Continue to encourage commercial investments at various levels in the dairy sector.** Since MERCADO will now enter its final implementation stage, we recommend continuing to encourage commercial investments at various levels in the dairy value chain. This includes three key components. First, on the input side, we recommend encouraging local commercial mills to collaborate with universities and develop affordable concentrate feed. Further, we recommend encouraging commercial retail sector players such as agro-vets and agro-dealers to begin handling feed, thereby expanding the distribution network of animal feed. To encourage private players to enter the market, we recommend working with the provincial governments to facilitate tax breaks and other incentives for these private agri-businesses. Second, on the milk aggregation side, since there is low political will for shifting ownership of dairy processing plants to private sector investors, we recommend instead encouraging a public-private partnership model wherein both, the private and public sector are jointly involved in management. Finally, we also recommend working with the government to encourage private and public sector investment in transportation services since lack of transportation options and poor road conditions was a key constraint outlined by most project beneficiaries.
- **Scale down the dairy demand campaign and continue to expand sales of local milk.** Through our quantitative surveys, we found that at midterm, there is insufficient supply to meet the demand. This was also revealed in the Special Study on “Assessment of Opportunities for Alternative Aggregation Models for Dairy Industry Growth in Mozambique”, wherein it was found that demand continues to outstrip supply, which increased the reliance on imported products.<sup>72</sup> Thus, as the project moves towards its final phase, we recommend capitalizing on the increased demand for local milk created through MERCADO's dairy demand campaign by scaling down the campaign and instead focusing on the supply side for the remainder of the project period. This includes four components. First, shifting focus towards the packaging, marketing, and branding of local milk and milk products as these are major barriers for local processors. Second, increase production volumes by continuing to transition more small farmers to medium-scale through the DHF to meet the high demand for milk. Third, we recommend continuing to increase the milk processing capacity of microprocessors by continuing to give them DIF grants to help grow their business. Finally, this involves expanding sales of local milk and milk products at the retail level by facilitating relationships between cooperatives, processors and small and mid-sized retailers.
- **Continue to increase production volumes.** At midterm, findings from this study point to consistently low levels of sales by small dairy farmers who form the bulk of the project beneficiaries. For key performance indicators on volume and value of sales, at midterm, only a small fraction of the life of project target was met. Given that, with respect to volume of

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<sup>72</sup> MERCADO Special Study. Assessment of Opportunities for Alternative Aggregation Models for Dairy Industry Growth in Mozambique, November 2018.

production *per cow*, the project seems to be on course to meet its life of project target, the key constraint to increasing the scale of operations appears to be increasing overall production volumes by increasing the number of cattle owned by farmers. As the project moves towards its final phase, increasing production volumes should form the most important component of the sustainability strategy of MERCADO. In this regard, we recommend the following:

- Making Gate 2 of the DIF more accessible. During qualitative focus groups, farmers reported that the current requirement of Gate 2 wherein 50 percent of the investment has to come from the project beneficiary is too onerous. Given that the project urgently needs to transform more small farmers into medium-scale farmers, we recommend making the allocation of Gate 2 to lower than 50 percent, with the exact allocation being decided in consultation with project beneficiaries. This will encourage more small farmers to apply for DIF grants and help transform them into medium-scale farmers.
  - Continuing to allocate resources by focusing on the *most efficient* small farmers who show great potential with the goal of generating more medium-scale farmers. Those farmers who are most willing to be integrated into the value-chain should be prioritized. MERCADO staff at the provincial level, including monitoring and evaluation specialists and field extensionists can work with the leadership of the cooperatives and farmers' associations to identify promising farmers who show the interest, motivation, and capacity to be successful in dairy production. Investing in such farmers is in line with the goal of MERCADO and would be more effective than distributing resources to farmers who may not have the capability to capitalize on the resources the project provides.
- **Improve market access for dairy farmers.** Many farmers discussed challenges in physically accessing buyers due to poor transportation conditions and lack of access to reliable transportation to carry milk. Additionally, the quantitative data show that MERCADO only marginally increased access to buyers. Poor transportation conditions often lead to milk going bad quickly. Thus, we recommend continuing to ensure milk collection points are within two hours of each farmer and ensuring milk-chilling equipment is available for each farmer, both of which are already being done by Venture37.
- **Continue to provide training in record keeping and management.** Most farmers reported keeping records of milk production, but less than half keep records on animal feeding and animal health. Monitoring the relationship between inputs (feed, medicines, care) and outputs (production and health) is a critical component of a successful farm. We recommend continuing to provide training on record keeping, with a focus on *why* and *how*, so farmers can use their records as a tool for managing their herds.
- **Provide training in marketing and sales.** Most cooperatives and processors reported that they were more professional and sustainable due to the training provided by the MERCADO project. However, businesses felt that lack of knowledge of sales and marketing was a roadblock in achieving their economic potential and resulted in lower levels of growth. We recommend providing training on sales and marketing to help interested businesses improve their net cash flow and strengthen their market linkages. Such training would be particularly useful for microprocessors, who struggle to remain viable in the face of large monopolies of one or two processors.

- **Promote transparency in pricing.** Most farmers and cooperatives noted a lack of price differences based on quality. Farmers in both Manica and Sofala, reported that, in most cases, the price of their milk was based not on bacteria content on the day the milk was brought in, but on the prices they had received in the past. Cooperatives reported that processors primarily used milk testing for quality control and did not implement price different based on quality. This was in contrast to the views of large processors in Manica who reported in qualitative interviews that they had a quality based payment system. Given the varying views regarding how milk is priced, we recommend promoting a more transparent quality based pricing system among the existing processors. A more transparent pricing system would instill more trust among players in the dairy sector by reducing uncertainty. Venture37 should work with cooperatives and large processors to encourage them to adopt (if not already adopting) and implement well (if already adopting) a clear differential pricing strategy for milk quality. Reducing arbitrariness in pricing will benefit all players in the dairy sector in the region.

### 7.4.3 Long-Term Strategy

- **Facilitate an increase in credit access for project beneficiaries.** Currently, there is heavy reliance of project beneficiaries on the in-kind and cash grants given through the DHF and DIF. With a view to ensuring long-term sustainability, we recommend steps towards increasing credit access among project beneficiaries. This could include:
  - Transitioning the DHF and DIF into a facility managed by banks and microfinance institutions. This would involve leveraging existing microfinance institutions in the area and transitioning the DHF and DIF to them for the remainder of the project period. This will develop trust between project participants and these local banks and microfinance institutions. This will be crucial for future lending prospects of project beneficiaries' post-MERCADO.
  - Continue reaching out to local agri-businesses and agricultural lending institutions in the area including Agricultural Development Fund (FDA), District Development Funds (FDD), Agriculture Promotion Centre (CEPAGRI), Cabinet for Promotion of Investment (CAPI), Investment Promotion Centre (CPI), and Institute for Promotion of Small and Medium-scale Enterprises (IPEME), and encourage them to provide input credit and short-term loans to project beneficiaries.
- **Facilitate an increase in the prices for milk received by farmers and cooperatives.** One of the main challenges that emerged from both quantitative and qualitative findings is that dairy farmers found it difficult to make their enterprises profitable because they received low prices from processors and cooperatives. Therefore, we believe that increasing the price paid to farmers will increase production by farmers and procurement in the formal market. A huge difference exists between prices received by farmers and prices paid by consumers. We suggest three options for helping farmers and cooperatives receive better milk prices:
  - Venture37 can promote transparency in pricing as outlined above by encouraging cooperatives and processors to clearly implement a differential pricing strategy based on milk quality. Reducing arbitrariness in pricing will benefit all players in the dairy sector in the region.
  - Venture37 should continue to help strengthen local cooperatives and provincial unions formed by small- and medium-scale farmers, which can improve their bargaining power, so they receive better prices. In many countries, small dairy farmers have successfully

achieved fairer prices by forming farmers' groups for collective bargaining.<sup>73</sup> This could also include training small- and medium-scale farmers on price negotiation.

- o Venture37 can continue its work towards reducing the monopoly of large processors and encouraging microprocessors to expand through increased DIF grants and encouragement of private investors.

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<sup>73</sup> [https://emnet.univie.ac.at/uploads/media/Grashuis\\_Cook.pdf](https://emnet.univie.ac.at/uploads/media/Grashuis_Cook.pdf)

## ANNEX A. PERFORMANCE MANAGEMENT PLAN

**Exhibit 104. Performance Management Plan<sup>74</sup>**

| # | Performance Indicator <sup>75</sup>                   | Data Source                         | Baseline Values <sup>76</sup>  | Midterm Values <sup>77</sup>              | Life of Project Target | Percent of Project Target Achieved |
|---|-------------------------------------------------------|-------------------------------------|--------------------------------|-------------------------------------------|------------------------|------------------------------------|
| 1 | Value of sales by project beneficiaries <sup>78</sup> | Producers, Cooperatives, Processors | \$1,050,635.61                 | \$289,877.50                              | \$29.5 million         | 0.98%                              |
|   |                                                       | Type of Business                    |                                |                                           |                        |                                    |
|   |                                                       | Small producers                     | \$1,177.31<br>[\$3.96]         | \$548.19 <sup>79</sup><br>[\$3.49]        |                        |                                    |
|   |                                                       | Medium producers                    | \$340.60<br>[\$18.92]          | \$140.67 <sup>44</sup><br>[\$5.86]        |                        |                                    |
|   |                                                       | Large producers <sup>80</sup>       | \$175,101.92<br>[\$127.40]     | \$153,194.27<br>(N=1)<br>[N/A]            |                        |                                    |
|   |                                                       | MCC/Cooperatives                    | \$10,662.48<br>[\$2,665.62]    | \$52,085.14<br>[\$10,417.03]              |                        |                                    |
|   |                                                       | Processors                          | \$865,126.70<br>[\$207,994.60] | \$59,709.23 <sup>81</sup><br>[\$7,463.65] |                        |                                    |
|   |                                                       | Breeder                             | \$0.00                         | \$24,200.00                               |                        |                                    |
|   |                                                       | Type of Commodity                   |                                |                                           |                        |                                    |
|   |                                                       | Dairy products                      | \$1,050,635.61                 | \$100,541.23                              |                        |                                    |

<sup>74</sup> We report midterm cumulative totals to maintain consistency with the baseline report. However, since the number of respondents to important production and sales indicators were much smaller at midterm, we also report the baseline and midterm mean values in square brackets, wherever applicable.

<sup>75</sup> We report only those indicators for which IMPAQ was responsible for ("consultant") as per the updated PMP shared by Venture37.

<sup>76</sup> Baseline values are generated using the full baseline sample for the PMP indicators, regardless of whether they were matched to midterm respondents. Means are not calculated for totals across producers, cooperatives, processors, and breeders, due to asymmetries in data collection.

<sup>77</sup> Midterm values are generated using the full midterm sample for the PMP indicators, regardless of whether they could be matched to baseline respondents. Means are not calculated for totals across producers, cooperatives, processors, and breeders, due to asymmetries in data collection.

<sup>78</sup> Calculated midterm values for this indicator are limited to the sample that answered the question series about volume of milk produced due to inconsistent response rates in this section of the questionnaire (the reduction in sample size with this condition is minimal – 8 farmers).

<sup>79</sup> Departing from the calculation of the value of sales in the main report, the PMP indicator calculation does not limit the sample of responses to those who answered the survey questions on seasonal milk production. Instead, those cow owning farmers who do not provide sales value information or did not answer production questions are imputed with the median value of sales (median disaggregated by farm scale) and included in this indicator's calculation. This was done to give a better representation of the cumulative total sum of milk sales value among respondents.

<sup>80</sup> No large producer reported value of sales in the midterm survey. We used Venture37's monitoring data from January to July 2019 to supplement their values. We extrapolated for the missing months of June – December 2018. IMPAQ has not independently verified the monitoring data.

<sup>81</sup> For those processors who did not provide information of value of sales we impute their responses with the mean value of sales. This was done to give a better representation of the cumulative total sum of milk sales value among respondents.

| # | Performance Indicator <sup>75</sup>                               | Data Source                         | Baseline Values <sup>76</sup> | Midterm Values <sup>77</sup>       | Life of Project Target | Percent of Project Target Achieved |
|---|-------------------------------------------------------------------|-------------------------------------|-------------------------------|------------------------------------|------------------------|------------------------------------|
|   |                                                                   | Livestock (dairy cattle)            | \$0.00                        | \$24,200.00                        |                        |                                    |
| 2 | Volume of commodities sold by project beneficiaries <sup>82</sup> | Producers, Cooperatives, Processors | 1406.56MT                     | 984.92MT                           | 22,900MT               | 4.30%                              |
|   |                                                                   | Type of Business                    |                               |                                    |                        |                                    |
|   |                                                                   | Small producers                     | 3.29MT<br>[0.11MT]            | 1.78MT <sup>83</sup><br>[0.01MT]   |                        |                                    |
|   |                                                                   | Medium producers                    | 0.96MT<br>[0.05MT]            | 0.44MT <sup>47</sup><br>[0.02MT]   |                        |                                    |
|   |                                                                   | Large producers <sup>84</sup>       | 225.36MT<br>[0.40MT]          | 724.18MT<br>(N=1)<br>[N/A]         |                        |                                    |
|   |                                                                   | MCC/Cooperatives                    | 70.81MT<br>[17.70MT]          | 168.28MT<br>[33.65MT]              |                        |                                    |
|   |                                                                   | Processors                          | 1111.17MT<br>[267.15MT]       | 90.24MT <sup>85</sup><br>[11.28MT] |                        |                                    |
|   |                                                                   | Breeders                            | 0 heifers                     | 22 heifers                         |                        |                                    |
|   |                                                                   | Type of Commodity                   |                               |                                    |                        |                                    |
|   |                                                                   | Dairy products                      | 1406.56MT                     | 230.66MT                           |                        |                                    |
|   |                                                                   | Livestock (dairy cattle)            | 0 heifers                     | 22 heifers                         |                        |                                    |
| 3 | Number of jobs attributed to USDA assistance <sup>86</sup>        | Producers, Cooperatives, Processors | 554*                          | 424                                | 600                    | 70.67%                             |
|   |                                                                   | Producers                           | 460<br>[1.46]                 | 361<br>[2.02]                      |                        |                                    |
|   |                                                                   | Male <sup>87</sup>                  | 414<br>[1.31]                 | 283<br>[1.58]                      |                        |                                    |
|   |                                                                   | Female                              | 46<br>[0.15]                  | 78<br>[0.44]                       |                        |                                    |
|   |                                                                   | MCC/Cooperatives                    | 83                            | 14                                 |                        |                                    |

<sup>82</sup> Calculated midterm values for this indicator are limited to the sample that answered the question series about volume of milk produced due to inconsistent response rates in this section of the questionnaire (the reduction in sample size with this condition is minimal – 8 farmers).

<sup>83</sup> Departing from the calculation of the volume of sales in the main report, the PMP indicator calculation does not limit the sample of responses to those who answered the survey questions on seasonal milk production. Instead, those cow owning farmers who do not provide sales volume information or did not answer production questions are imputed with the median volume of sales (median disaggregated by farm scale) and are included in this indicator's calculation. This was done to give a better representation of the cumulative total sum of milk sales volume among respondents.

<sup>84</sup> No large producer reported volume of sales in the midterm survey. We used Venture37's monitoring data from January to July 2019 to supplement their volume of sales. We extrapolated for the missing months of June – December 2018. IMPAQ has not independently verified the monitoring data.

<sup>85</sup> For those processors who did not provide information of volume of sales we impute their responses with the mean value of sales. This was done to give a better representation of the cumulative total sum of milk sales volume among respondents.

<sup>86</sup> Male and female employment calculated independently, then summed for cumulative totals.

<sup>87</sup> Gender is defined in each round and the sample is restricted to those who self-reported their gender. Because of reduced sample sizes for those who self-reported, male and female values will not add up to the "total" value presented.

| #  | Performance Indicator <sup>75</sup>                                                                  | Data Source       | Baseline Values <sup>76</sup> | Midterm Values <sup>77</sup> | Life of Project Target   | Percent of Project Target Achieved |
|----|------------------------------------------------------------------------------------------------------|-------------------|-------------------------------|------------------------------|--------------------------|------------------------------------|
|    |                                                                                                      |                   | <b>[2.75]</b>                 | <b>[2.8]</b>                 |                          |                                    |
|    |                                                                                                      | Male              | 52<br>[1.50]                  | 11<br>[2.2]                  |                          |                                    |
|    |                                                                                                      | Female            | 31<br>[1.25]                  | 3<br>[0.6]                   |                          |                                    |
|    |                                                                                                      | <b>Processors</b> | <b>11</b><br><b>[17.80]</b>   | <b>49</b><br><b>[6.12]</b>   |                          |                                    |
|    |                                                                                                      | Male              | 6<br>[13.50]                  | 32<br>[4]                    |                          |                                    |
|    |                                                                                                      | Female            | 5<br>[8.75]                   | 17<br>[2.12]                 |                          |                                    |
| 7  | Volume of milk output per cow per day during lactation for participating dairy farmers <sup>88</sup> | <b>Producers</b>  | <b>8.78 liters</b>            | <b>9.46 liters</b>           | 11                       | 86.00%                             |
|    |                                                                                                      | Male owner        | 8.60 liters                   | 11.8 liters                  |                          |                                    |
|    |                                                                                                      | Female owner      | 9.06 liters                   | 7.88 liters                  |                          |                                    |
|    |                                                                                                      | Small producers   | 9.06 liters                   | 9.69 liters                  |                          |                                    |
|    |                                                                                                      | Medium producers  | 4.62 liters                   | 8.19 liters                  |                          |                                    |
|    |                                                                                                      | Large producers   | 9.37 liters (N=2)             | N/A                          |                          |                                    |
| 8  | Average number of days in lactation period <sup>89</sup>                                             | <b>Producers</b>  | <b>269.19 days</b>            | <b>239.56 days</b>           | 290                      | 82.61%                             |
|    |                                                                                                      | Male owner        | 283.21 days                   | 197.92 days<br>(N=4)         |                          |                                    |
|    |                                                                                                      | Female owner      | 249.62 days                   | 282.20 days<br>(N=2)         |                          |                                    |
|    |                                                                                                      | Small producers   | 261.83 days                   | 233.48 days                  |                          |                                    |
|    |                                                                                                      | Medium producers  | 451.42 days<br>(N=3)          | 300.39 days<br>(N=1)         |                          |                                    |
|    |                                                                                                      | Large producer    | N/A                           | N/A                          |                          |                                    |
| 9  | Average calving interval                                                                             | <b>Producers</b>  | <b>510.16 days</b>            | <b>464.16 days</b>           | 19 months<br>(~570 days) | 81.43%                             |
|    |                                                                                                      | Male owner        | 509.57 days                   | 454.00 days<br>(N=2)         |                          |                                    |
|    |                                                                                                      | Female owner      | 510.89 days                   | 485.13 days<br>(N=4)         |                          |                                    |
|    |                                                                                                      | Small producers   | 513.09 days                   | 469.19 days                  |                          |                                    |
|    |                                                                                                      | Medium producers  | 497.06 days<br>(N=2)          | 436.50 days<br>(N=2)         |                          |                                    |
|    |                                                                                                      | Large producers   | N/A                           | N/A                          |                          |                                    |
| 10 | Number of individuals who                                                                            | <b>Producers</b>  | <b>315*</b><br><b>[100%]</b>  | <b>183</b><br><b>[100%]</b>  | <b>350</b>               | <b>52.29%</b>                      |

<sup>88</sup> Baseline values for this indicator were calculated using the number of dairy cows owned by the farmer as the “per-cow” denominator since the baseline survey did not include questions on the seasonal number of lactating dairy cows. For midterm, it is calculated using the number of lactating cows in a given season as the “per cow” denominator.

<sup>89</sup> Average lactation period at midterm has some negative values that we assume are off by one year from the intended end date of the lactation period; these values were increased by 365 days to adjust for the error (3 farmers affected). This variable also had very low values which were below a reasonable minimum duration for cow lactation of 120 days and so were changed to missing values (2 farmers were affected).



| #  | Performance Indicator <sup>75</sup>                                                         | Data Source                     | Baseline Values <sup>76</sup>      | Midterm Values <sup>77</sup> | Life of Project Target | Percent of Project Target Achieved |
|----|---------------------------------------------------------------------------------------------|---------------------------------|------------------------------------|------------------------------|------------------------|------------------------------------|
|    | have applied new techniques or technologies as a result of USDA assistance <sup>90,91</sup> | Male owner                      | 187<br>[100%]                      | 68<br>[100%]                 |                        |                                    |
|    |                                                                                             | Female owner                    | 128<br>[100%]                      | 31<br>[100%]                 |                        |                                    |
|    |                                                                                             | Small producers                 | 295<br>[100%]                      | 157<br>[100%]                |                        |                                    |
|    |                                                                                             | Medium producers                | 18<br>[100%]                       | 24<br>[100%]                 |                        |                                    |
|    |                                                                                             | Large producers                 | 2<br>[100%]                        | 2<br>[100%]                  |                        |                                    |
|    |                                                                                             | Zero-grazing                    | N/A                                | 141<br>[77.05%]              |                        |                                    |
|    |                                                                                             | Forage                          | N/A                                | 148<br>[81.32%]              |                        |                                    |
|    |                                                                                             | Supplements                     | N/A                                | 169<br>[92.35%]              |                        |                                    |
|    |                                                                                             | Continuous water access         | 8<br>[2.94%]                       | 34<br>[18.78%]               |                        |                                    |
|    |                                                                                             | Milking machine                 | 6<br>[1.90%]                       | 7<br>[3.83%]                 |                        |                                    |
|    |                                                                                             | CMT mastitis test               | 56<br>[22.13%]                     | 102<br>[75.00%]              |                        |                                    |
|    |                                                                                             | Cup mastitis test               | 78<br>[30.83%]                     | 51<br>[37.50%]               |                        |                                    |
|    |                                                                                             | Visual mastitis test            | 165<br>[65.22%]                    | 58<br>[42.62%]               |                        |                                    |
|    |                                                                                             | Vaccinations                    | 237<br>[75.24%]                    | 155<br>[86.11%]              |                        |                                    |
|    |                                                                                             | Steel receptacles               | 282<br>[89.52%]                    | 107<br>[60.11%]              |                        |                                    |
|    |                                                                                             | Withhold milk after antibiotics | 36<br>[27.91%]                     | N/A                          |                        |                                    |
|    |                                                                                             | Weekly tick control             | 101<br>[32.06%]                    | 45<br>[26.32%]               |                        |                                    |
| 11 | Number of hectares under                                                                    | Producers                       | 506.3* hectares<br>[6.84 hectares] | 339 hectares                 | 600 hectares           | 56.50%                             |

<sup>90</sup> This indicator is defined at midterm as having applied *at least one* of the following techniques: (1) improved feeding (use of zero-grazing, supplements, and fodder), (2) continuous access to water, (3) having a clean corral, (4) weekly tick treatments, (5) use of vaccinations on cows, (6) use of a milking machine, (7) using steel receptacles for milk, and CMT, cup, or visual testing for mastitis. At baseline this indicator was defined as using at least one of the following techniques: (1) use of supplements, (2) use of fodder, (3) continuous access to water, (4) use of a milking machine, (5) using a cup or CMT test for mastitis testing, (6) use of vaccinations, (7) testing for ticks at all, (8) use of steel receptacles for milk, and (9) withholding milk from sale after using antibiotics on cows.

<sup>91</sup> Gender is defined in each round and the sample is restricted to those who self-reported their gender. Because of reduced sample sizes for those who self-reported, male and female values will not add up to the “total” value presented.

| #  | Performance Indicator <sup>75</sup>                                                                                                                                                  | Data Source                | Baseline Values <sup>76</sup>     | Midterm Values <sup>77</sup>             | Life of Project Target | Percent of Project Target Achieved |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------|------------------------------------------|------------------------|------------------------------------|
|    | improved techniques or technologies as a result of USDA assistance <sup>92</sup>                                                                                                     |                            |                                   | <b>[13.56 hectares]</b>                  |                        |                                    |
|    |                                                                                                                                                                                      | New producer <sup>93</sup> | N/A                               | 36 hectares<br>[3.6 hectares]            |                        |                                    |
|    |                                                                                                                                                                                      | Continuing producer        | N/A                               | 303 hectares<br>[20.2 hectares]          |                        |                                    |
|    |                                                                                                                                                                                      | Male owner                 | 402.9 hectares<br>[9.83 hectares] | 33 hectares<br>(N=14)<br>[2.36 hectares] |                        |                                    |
|    |                                                                                                                                                                                      | Female owner               | 103.4 hectares<br>[3.13 hectares] | 10 hectares<br>(N=2)<br>[5.00 hectares]  |                        |                                    |
| 12 | Number of individuals who have applied improved farm management practices (i.e. governance, administration, or financial management) as a result of USDA assistance <sup>94,95</sup> | <b>Producers</b>           | <b>81*</b><br><b>[33.20%]</b>     | <b>145</b><br><b>[81.01%]</b>            | <b>105</b>             | <b>138.10%</b>                     |
|    |                                                                                                                                                                                      | Male owner                 | 51<br>[35.42%]                    | 56<br>[83.58%]                           |                        |                                    |
|    |                                                                                                                                                                                      | Female owner               | 30<br>[30.00%]                    | 22<br>[70.97%]                           |                        |                                    |
|    |                                                                                                                                                                                      | Small producers            | 75<br>[32.33%]                    | 120<br>[78.43%]                          |                        |                                    |
|    |                                                                                                                                                                                      | Medium producers           | 5<br>[45.45%]                     | 23<br>[95.83%]                           |                        |                                    |
|    |                                                                                                                                                                                      | Large producers            | 1 (N=1)<br>[100.00%]              | 2<br>[100%]                              |                        |                                    |
| 13 | Percentage of dairy farmers that indicate ready access to key dairy inputs <sup>96</sup>                                                                                             | <b>Producers</b>           | <b>13.3%*</b>                     | <b>36.61%</b>                            | <b>80%</b>             | <b>45.76%</b>                      |
|    |                                                                                                                                                                                      | Male owner                 | 14.4%                             | 36.76%                                   |                        |                                    |
|    |                                                                                                                                                                                      | Female owner               | 11.6%                             | 41.94%                                   |                        |                                    |
|    |                                                                                                                                                                                      | Small producers            | 12.1%                             | 33.12%                                   |                        |                                    |
|    |                                                                                                                                                                                      | Medium producers           | 27.8%                             | 58.33%                                   |                        |                                    |

<sup>92</sup> Gender is defined in each round and the sample is restricted to those who self-reported their gender. Because of reduced sample sizes for those who self-reported, male and female values will not add up to the “total” value presented.

<sup>93</sup> New producers are defined as belonging to the midterm sample that could not be matched to baseline, while continuing producers are those midterm farmers who could be matched to baseline.

<sup>94</sup> IMPAQ used four variables at baseline to create this indicator: (1) keeping a daily dairy production register; (2) keeping a daily milk allocation register; (3) keeping a farm transaction register (revenues and expenses); and (4) keeping a register animal health visits (as was done at baseline). The farmers were counted to have applied improved farm management only if they had all four of these types of record keeping. At midterm, we add the development *and* use of a business plan as a fifth type of improved management practice; those who used at least one of the five types of improved management practices are counted as having applied them at midterm. This is updated at midterm to better match the PMP indicator description of using *at least one* of the practices.

<sup>95</sup> Gender is defined in each round and the sample is restricted to those who self-reported their gender. Because of reduced sample sizes for those who self-reported, male and female values will not add up to the “total” value presented.

<sup>96</sup> At baseline, access to key dairy inputs was defined as having easy or very easy access to at least four of the inputs listed after “large producers” for this indicator. At midterm, easy or very easy access to a milking machine is no longer required, and only at least three of the inputs must be easy or very easy to access. This change was done to better match the given PMP indicator definition.

| #  | Performance Indicator <sup>75</sup>                                                                     | Data Source                                          | Baseline Values <sup>76</sup> | Midterm Values <sup>77</sup> | Life of Project Target | Percent of Project Target Achieved |
|----|---------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------|------------------------------|------------------------|------------------------------------|
|    |                                                                                                         | Large producers                                      | 50.0%                         | 50.00%                       |                        |                                    |
|    |                                                                                                         | Supplements                                          | 55.7%                         | 35.33%                       |                        |                                    |
|    |                                                                                                         | Forage                                               | 56.2%                         | 33.56%                       |                        |                                    |
|    |                                                                                                         | Milking machine                                      | 20.0% (N=5)                   | N/A                          |                        |                                    |
|    |                                                                                                         | Steel receptacles                                    | 17.6%                         | 34.88%                       |                        |                                    |
|    |                                                                                                         | Mastitis test                                        | 31.9%                         | 44.21%                       |                        |                                    |
|    |                                                                                                         | Heifers                                              | 22.9%                         | 60.81%                       |                        |                                    |
|    |                                                                                                         | Health services for cattle                           | 34.6%                         | 52.20%                       |                        |                                    |
| 14 | Percentage of dairy producers that have improved on-farm infrastructure <sup>97</sup>                   | <b>Producers</b>                                     | <b>98.65%**</b>               | <b>86.89%</b>                | 50%                    | 173.78%                            |
|    |                                                                                                         | Male owner                                           | 8.6%                          | 89.71%                       |                        |                                    |
|    |                                                                                                         | Female owner                                         | 11.0%                         | 77.42%                       |                        |                                    |
|    |                                                                                                         | Small producers                                      | 9.6%                          | 85.35%                       |                        |                                    |
|    |                                                                                                         | Medium producers                                     | 0.0% (N=3)                    | 95.83%                       |                        |                                    |
|    |                                                                                                         | Large producers                                      | N/A                           | 100%                         |                        |                                    |
|    |                                                                                                         | Milk Chilling                                        | N/A                           | 25.14%                       |                        |                                    |
|    |                                                                                                         | Tractor                                              | 1.4%**                        | N/A                          |                        |                                    |
|    |                                                                                                         | Milk Machine                                         | 1.8%**                        | 3.83%                        |                        |                                    |
|    |                                                                                                         | Milk Filter                                          | 74.3%**                       | 75.84%                       |                        |                                    |
|    |                                                                                                         | Feeder                                               | 64.9%**                       | 48.02%                       |                        |                                    |
|    |                                                                                                         | Corral with shade                                    | 77.4%**                       | 48.30%                       |                        |                                    |
|    |                                                                                                         | Corral with ventilation                              | 81.5%**                       | 96.02%                       |                        |                                    |
|    |                                                                                                         | Corral with dry floor                                | N/A                           | 90.34%                       |                        |                                    |
|    |                                                                                                         | Corral with concrete material under the milking area | 37.4%**                       | 42.05%                       |                        |                                    |
|    |                                                                                                         | Corral with fodder receptor                          | 69.4%**                       | 79.55%                       |                        |                                    |
| 17 | Percentage of trained dairy producers that can accurately recite improved dairy practices <sup>98</sup> | <b>Producers</b>                                     | <b>70.3%</b>                  | <b>88.52%</b>                | 80%                    | 110.65%                            |
|    |                                                                                                         | Male owner                                           | 71.8%                         | 83.82%                       |                        |                                    |
|    |                                                                                                         | Female owner                                         | 68.2%                         | 87.10%                       |                        |                                    |
|    |                                                                                                         | Small producers                                      | 71.4%                         | 79.61%                       |                        |                                    |
|    |                                                                                                         | Medium producers                                     | 55.6%                         | 83.33%                       |                        |                                    |
|    |                                                                                                         | Large producers                                      | 50.0% (N=2)                   | 100.00%                      |                        |                                    |
|    |                                                                                                         | Ways to improve pasture quality                      | 83.3%                         | 71.04%                       |                        |                                    |
|    |                                                                                                         | Advantages of artificial insemination                | 83.0%                         | 74.86%                       |                        |                                    |

<sup>97</sup> Improved infrastructure is defined as having at least one of the following: (1) improved kraal (with shade, ventilation, suitable flooring, concrete material under the milking area, and fodder receptor), (2) milking machine, (3) chilling facilities, (4) feeder, and (5) milk filter

<sup>98</sup> Three new practices were added at midterm. Accurate recital of improved dairy practices is defined at midterm as those who can recite on at least 4 of the following: (1) pasture quality (2) artificial insemination (3) corral equipment (4) mastitis prevention (5) best practices in cow feeding (6) advantages of keeping the corral hygienic (7) ways to maintain quality of milk. At baseline this definition was that the farmer be able to recite at least 3 of the first four improved dairy practices.

| #  | Performance Indicator <sup>75</sup>                                                                   | Data Source                                | Baseline Values <sup>76</sup> | Midterm Values <sup>77</sup> | Life of Project Target | Percent of Project Target Achieved |
|----|-------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|------------------------------|------------------------|------------------------------------|
|    |                                                                                                       | Most important equipment in corral         | 83.0%                         | 80.33%                       |                        |                                    |
|    |                                                                                                       | How to prevent or control mastitis         | 85.8%                         | 90.71%                       |                        |                                    |
|    |                                                                                                       | Best practices in cow feeding              | N/A                           | 81.97%                       |                        |                                    |
|    |                                                                                                       | Advantages of keeping corral hygienic      | N/A                           | 97.27%                       |                        |                                    |
|    |                                                                                                       | Ways to maintain quality of milk           | N/A                           | 75.14%                       |                        |                                    |
| 18 | Percentage of trained dairy producers that can demonstrate financial literacy <sup>99</sup>           | <b>Producers</b>                           | <b>71.30%</b>                 | <b>63.93%</b>                | <b>75%</b>             | <b>85.24%</b>                      |
|    |                                                                                                       | Male owner                                 | 70.70%                        | 66.18%                       |                        |                                    |
|    |                                                                                                       | Female owner                               | 72.10%                        | 70.97%                       |                        |                                    |
|    |                                                                                                       | Small producers                            | 71.00%                        | 61.78%                       |                        |                                    |
|    |                                                                                                       | Medium producers                           | 77.80%                        | 75.00%                       |                        |                                    |
|    |                                                                                                       | Large producers                            | 50.00% (N=2)                  | 100.00% (N=2)                |                        |                                    |
| 25 | Number of producers, MCCs, and processors that adopt established standards <sup>100</sup>             | <b>Producers, Cooperatives, Processors</b> | <b>0</b>                      | <b>16</b>                    | <b>14</b>              | <b>114.29%</b>                     |
|    |                                                                                                       | Small producers                            | 0                             | 0 [0.00%]                    |                        |                                    |
|    |                                                                                                       | Medium producers                           | 0                             | 3 [12.50%]                   |                        |                                    |
|    |                                                                                                       | Large producers                            | 0                             | 2 [100.00%]                  |                        |                                    |
|    |                                                                                                       | MCC/Cooperatives                           | 0                             | 5 [N/A]                      |                        |                                    |
|    |                                                                                                       | Processors                                 | 0                             | 6 [N/A]                      |                        |                                    |
| 26 | Number of producers, MCCs, and processors that adopt improved post-production handling <sup>101</sup> | <b>Producers, Cooperatives, Processors</b> | <b>7</b>                      | <b>13</b>                    | <b>16</b>              | <b>81.25%</b>                      |
|    |                                                                                                       | Small producers                            | 0                             | 0 [0.00%]                    |                        |                                    |
|    |                                                                                                       | Medium producers                           | 0                             | 1 [4.17%]                    |                        |                                    |
|    |                                                                                                       | Large producers                            | 0                             | 0 [0.00%]                    |                        |                                    |
|    |                                                                                                       | MCC/Cooperatives                           | 4                             | 5 [N/A]                      |                        |                                    |
|    |                                                                                                       | Processors                                 | 3                             | 7                            |                        |                                    |

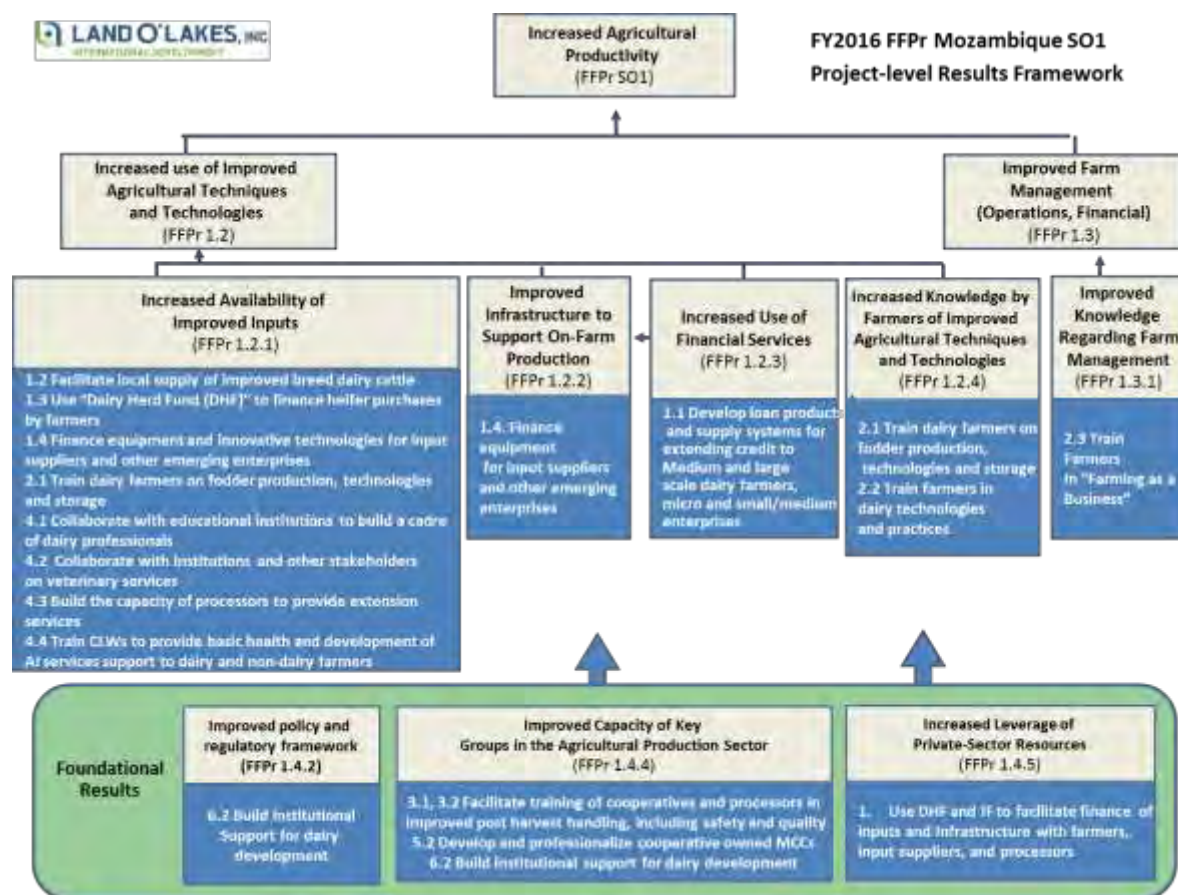
<sup>99</sup> Financial literacy is defined as those who know to use both revenue and expenses to calculate profit from their dairy business.

<sup>100</sup> Adoption of standards is defined as using all of the following for both baseline and midterm: (1) using a milking machine, (2) inspecting for mastitis, (3) using a stainless steel container, and (4) using milk filters.

<sup>101</sup> Adoption of improved post-production handling is defined as using all of the following at baseline: (1) using a milking machine, (2) at least one improved practice in corral, (3) quality testing milk before selling, and (4) using a stainless steel container.

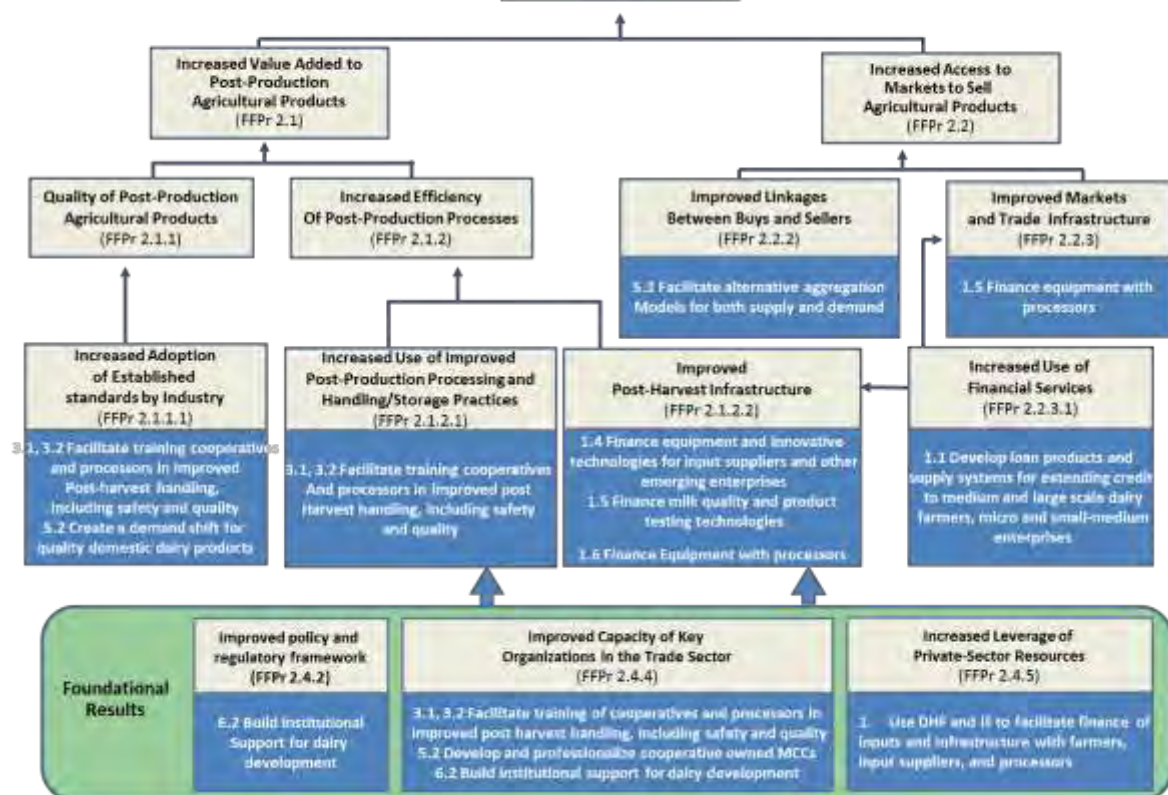
| #                                                                                                                    | Performance Indicator <sup>75</sup>                                                               | Data Source                         | Baseline Values <sup>76</sup>                   | Midterm Values <sup>77</sup>                   | Life of Project Target | Percent of Project Target Achieved |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------------|------------------------------------------------|------------------------|------------------------------------|
|                                                                                                                      |                                                                                                   |                                     |                                                 | [N/A]                                          |                        |                                    |
| 27                                                                                                                   | Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance | Producers, Cooperatives, Processors | 26.80 cubic meters*                             | 28.32 cubic meters                             | 10 m <sup>3</sup>      | 283.20%                            |
|                                                                                                                      |                                                                                                   | Small producers                     | 0.17 m <sup>3</sup><br>[0.001 m <sup>3</sup> ]  | 0.50 m <sup>3</sup><br>[0.50 m <sup>3</sup> ]  |                        |                                    |
|                                                                                                                      |                                                                                                   | Medium producers                    | 3.18 m <sup>3</sup><br>[0.20 m <sup>3</sup> ]   | 3.20 m <sup>3</sup><br>[0.80 m <sup>3</sup> ]  |                        |                                    |
|                                                                                                                      |                                                                                                   | Large producers                     | 0.00 m <sup>3</sup><br>[0.00 m <sup>3</sup> ]   | 1.70 m <sup>3</sup><br>[0.85 m <sup>3</sup> ]  |                        |                                    |
|                                                                                                                      |                                                                                                   | MCC/Cooperatives                    | 3.45 m <sup>3</sup><br>[0.86 m <sup>3</sup> ]   | 5.79 m <sup>3</sup><br>[1.16 m <sup>3</sup> ]  |                        |                                    |
|                                                                                                                      |                                                                                                   | Processors                          | 20.00 m <sup>3</sup><br>[0.001 m <sup>3</sup> ] | 17.13 m <sup>3</sup><br>[2.14 m <sup>3</sup> ] |                        |                                    |
| * Indicator value is 0 at baseline. Actual baseline values have been provided as a point of reference for Venture37. |                                                                                                   |                                     |                                                 |                                                |                        |                                    |
| ** Indicator calculated with data from MDDP Final Evaluation dataset at baseline.                                    |                                                                                                   |                                     |                                                 |                                                |                        |                                    |

## ANNEX B. MERCADO FFPR RESULTS FRAMEWORK



**Expanded Trade of  
Agricultural Products  
(FFPr SO2)**

**FY2016 FFPr Mozambique SO2  
Project-level Results Framework**





## ANNEX C. EVALUATION QUESTIONS, DATA COLLECTION METHODS, AND DATA SOURCES

| Evaluation Criteria | Evaluation Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Data Collection Method                                                                                                                            | Data Source                                                                                       |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Relevance</b>    | Does the results framework, assumptions, project design and project activities meet the needs of the participants and local conditions in Mozambique's Manica and Sofala Provinces?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Focus Groups<br>Semi-Structured Surveys<br>Key Informant Interviews                                                                               | Dairy Farmers<br>Value Chain Actors<br>Project Staff<br>Other Stakeholders                        |
|                     | How well aligned are MERCADO's strategy and activities with the development goals, objectives and strategies of USDA, the U.S. Government and the Mozambican Government?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Key Informant Interviews                                                                                                                          | Other Stakeholders                                                                                |
| <b>Impacts</b>      | <p>What impacts are the project activities having on the project participants, both positive and negative, especially in relation to the expected results and strategic objectives?</p> <p>How has the project-provided training impacted the knowledge and uptake of improved agricultural, farm management practices and post-harvest handling?</p> <p>How has the use of improved practices affected agricultural productivity (<i>measured through liters of milk per day, number of days of lactation, and calving interval for dairy and through yield for forage</i>)?</p> <p>To what extent has increased access to input suppliers affected the uptake of improved agricultural techniques, farm management practices, post-harvest handling, and use of improved infrastructure for farmers?</p> <p>How has training in improved safety and quality affected the rate of rejection of milk at the aggregation level?</p> <p>How have project activities influenced total value and quantity of milk and milk product sales?</p> <p>How is value-capture distributed across different milk market system actors? What can be done to improve value capture and profitability of the actors?</p> <p>To what extent has access to finance affected the growth of farmer dairy businesses?</p> <p>To what extent has access to finance affected uptake of improved processing techniques, quality standards, and improved infrastructure for processors?</p> <p>To what extent have the advocacy activities affected the policy and regulatory framework to support growth and investment in the dairy sector?</p> | <p>Panel Survey<br/>Focus Groups<br/>Semi-Structured Surveys<br/>Key Informant Interviews<br/>Value Chain Analysis<br/>Review of M&amp;E Data</p> | <p>Dairy Farmers<br/>Students<br/>Value Chain Actors<br/>Project Staff<br/>Other Stakeholders</p> |

| <b>Evaluation Criteria</b>        | <b>Evaluation Question</b>                                                                                                                    | <b>Data Collection Method</b>                                                                            | <b>Data Source</b>                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|                                   | What internal and external factors have influenced the ability of the project to meet expected results and targets?                           | Key Informant Interviews                                                                                 | Dairy Farmers<br>Students<br>Value Chain Actors<br>Project Staff<br>Other Stakeholders |
|                                   | What internal and external factors have influenced the ability of the project to meet expected results and targets?                           | Key Informant Interviews                                                                                 | Dairy Farmers<br>Students<br>Value Chain Actors<br>Project Staff<br>Other Stakeholders |
| <b>Effectiveness</b>              | To what extent are the project targets and outcomes likely to be achieved by the end of the project?                                          | Key Informant Interviews<br>Focus Groups                                                                 | Dairy Farmers<br>Project Staff<br>Project M&E Data<br>Other local data                 |
|                                   | What key successes should be replicated or key improvements should be made to the implementation to maximize the results?                     | Panel Survey<br>Focus Groups<br>Semi-Structured Survey<br>Key Informant Interviews                       | Dairy Farmers<br>Students<br>Value Chain Actors<br>Project Staff<br>Other Stakeholders |
| <b>Efficiency</b>                 | Were the resources and activities provided by the project carried out in a timely manner and with effective use of resources?                 | Focus Groups<br>Semi-Structured Survey<br>Key Informant Interviews                                       | Dairy Farmers<br>Students<br>Value Chain Actors<br>Project Staff<br>Other Stakeholders |
|                                   | How well has the project been managed and M&E data used to make projectmatic decisions?                                                       | Semi-Structured Surveys<br>Key Informant Interviews<br>Review of M&E Data                                | Project Staff<br>Other Stakeholders                                                    |
| <b>Sustainability</b>             | Which project activities and benefits are likely to be sustained or not sustained past the project lifespan, why?                             | Panel Survey<br>Focus Groups<br>Semi-Structured Survey<br>Key Informant Interviews<br>Review of M&E Data | Dairy Farmers<br>Students<br>Value Chain Actors<br>Project Staff<br>Other Stakeholders |
|                                   | What exit strategy has the project put into place to ensure the sustainability of the project outcomes?                                       | Key Informant Interviews                                                                                 | Project Staff<br>Other Stakeholders                                                    |
|                                   | What activities could the project scale down or eliminate and not affect project outcomes; to account for reduction in monetization proceeds? | Key Informant Interviews                                                                                 | Project Staff<br>Other Stakeholders                                                    |
| <b>Gender Equality and Equity</b> | How did the project address the constraints faced by women in the dairy sector?                                                               | Panel Survey<br>Focus Groups<br>Semi-Structured Survey<br>Key Informant Interviews                       | Dairy Farmers<br>Students<br>Value Chain Actors<br>Project staff<br>Other Stakeholders |

| Evaluation Criteria | Evaluation Question                                                                                                                                                         | Data Collection Method                                                                                   | Data Source                                                                            |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                             | Review of M&E Data                                                                                       |                                                                                        |
|                     | What did the project do to ensure participation of both men and women? What could the project have done better?                                                             | Focus Groups<br>Semi-Structured Survey<br>Key Informant Interviews                                       | Dairy Farmers<br>Students<br>Value Chain Actors<br>Project Staff<br>Other Stakeholders |
|                     | How did the outcomes of the project differ between men and women? What could the project have done differently to ensure that equal benefits accrued to both women and men? | Panel Survey<br>Focus Groups<br>Semi-Structured Survey<br>Key Informant Interviews<br>Review of M&E Data | Dairy Farmers<br>Students<br>Value Chain Actors<br>Other Stakeholders                  |
|                     |                                                                                                                                                                             |                                                                                                          |                                                                                        |

## ANNEX D. INCEPTION REPORT

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### INTRODUCTION

Venture37 International Development (Venture37) has contracted IMPAQ International, LLC (IMPAQ) to implement the performance evaluation of the five-year Mozambique Expansion of Rural Cattle and Dairy Opportunities (MERCADO) project, funded by the United States Department of Agriculture (USDA). The evaluation consists of three components: baseline and gender analysis (2016), midterm (2019), and final (2021) evaluations.

This Inception Report introduces the theory, methods, and tools that will guide IMPAQ International's *midterm evaluation* of Venture37's MERCADO dairy sector development project in Mozambique. We begin the report by presenting a background of the project, specific project activities, the Results Framework, and the evaluation objectives based on our review of documents and discussions with Venture37 project staff. In the next section, we present our evaluation methodology including our quantitative and qualitative data sources, sampling plan, data collection methods, analysis plan, field procedures, and communications protocol. We conclude with a timeline of activities and project outputs along with a list of personnel assignments. Data collection tools are included as annexes.

### PROJECT BACKGROUND

Mozambique historically had significant dairy production. In 1973, Mozambique reached its peak number of dairy cows and milk production with 13,200 cows and over 13 million kilograms of milk produced. However, after the country's independence in 1975, a 16-year civil war caused the dairy industry to almost disappear. Currently, official statistics place the number of dairy cows at 2,209, 80.4 percent of which are in the provinces of Sofala and Manica (Beira Corridor).<sup>102</sup> The country is almost completely dependent on imports for milk and milk products because of the decline in number of dairy cows and poor management of dairy production. In 1992, the contribution of the national production to the total milk and dairy products consumed was 6 percent, a figure that, 20 years later, is largely unchanged at 6.4 percent.<sup>103</sup>

The Strategic Plan for Dairy Development in Mozambique and government interventions identify the Beira Corridor as a priority location in which to reestablish dairy production in the country and the potential for dairy production in Maputo, Zambezia, and Nampula provinces. The peri-urban areas of Beira and Chimoio cities, in which dairy production is now being re-established by Venture37, are the same areas in which dairy farms were concentrated previously.<sup>104</sup>

Since 2008, Venture37 has led the revival of the Mozambican dairy industry, leveraging USDA-Food for Progress funding to build a supply base and distribution system for domestically produced milk. These efforts have facilitated capacity building, market linkages, and financial investments that are essential for sustaining the development of a socially inclusive yet market-driven industry.

### Venture37 MERCADO Intervention and Results Framework

The USDA-supported MERCADO project is Venture37's third Mozambican dairy sector development initiative. The five-year program began in October 2016 and seeks to address critical weaknesses that currently impede or threaten the competitiveness and sustainability within the dairy market system. MERCADO will use a private-sector-driven, market systems approach to attempt "to establish a commercial-oriented, sustainable and competitive dairy market system in Mozambique," which is

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<sup>102</sup> Land O'Lakes MERCADO Baseline, Midterm, and Final Evaluation Terms of Reference (Updated); December 6, 2016; pg. 1.

<sup>103</sup> Ibid; pp. 1.

<sup>104</sup> Ibid; pp. 1-2.

competitive locally, regionally, and nationally. To accomplish this goal, the project will work to increase dairy productivity and quality at the farm level to help meet unmet demand for liquid milk by the processing industry, while also promoting quality, efficiency, and business viability along the value chain. The dual emphasis on farm-level productivity and value chain development correspond with strategic objectives of Increased Agricultural Productivity (FFPr SO1) and Expanded Trade of Agricultural Products (FFPr SO2) of the USDA's FFPr initiative. Venture37 is implementing MERCADO project activities in the dairy producing areas of the Beira Corridor, particularly the peri-urban areas of the cities of Chimoio (Manica Province) and Beira (Sofala Province).

MERCADO's Results Frameworks (see **ANNEX B**) links project activities and outputs with desired outcomes and project-level results. The causal logic underlying MERCADO's Results Framework posits that facilitation of training, equipment, and inputs among dairy value chain actors will increase their know-how and productive capacity to produce and add value to quality milk products, while simultaneous improvements to the market (in particular, prices and market terms, and local demand) will increase their motivation to do so. This will also lead to increases in the volume and quality of milk that is produced at the farm level and subsequently improve quality along the value chain. Together, increased volumes and quality of production will enable the emergence of a competitive, profitable, and sustainable dairy market system.

To improve the productivity of dairy cows, MERCADO will both improve the quality and availability of improved inputs, such as animal health services, extension services, feed and fodder, and dairy equipment, and improve the capacity of dairy farmers to care for their animals. To improve input quality and availability, MERCADO will retrain paravets, trained in the previous projects to provide services to the dairy farmers. MERCADO will also continue to provide updated curricula and internships for students at local technical institutes that are interested in entering the dairy sector. The project will also work with agro-businesses and feed and fodder producers, and other input providers to increase their capacity and facilitate access to finance to start and or grow their businesses.

To improve the capacity of dairy farmers, MERCADO supports technical and farm management capacity building to dairy farmers to improve their dairy and farm practices. It is expanding dairy input service delivery, including extension services, animal health services, and feed and fodder provision. It is also facilitating access to finance to purchase livestock, production and trade infrastructure; promoting private investments in the dairy sector; and strengthening linkages between buyers and sellers.

In combination with increases in productivity and quality at the farm-level, the project is providing training, capacity building, and financial services that will improve quality and productivity all along the dairy value chain. The project also recognizes that, in the face of unmet demand, dependence on relatively few large-scale commercial milk processors makes farmers and other value chain actors vulnerable to disadvantageous price and market conditions. In this context, the project seeks to increase diversity and competition along the value chain by promoting the entry of new market actors particularly at the processing level, while also promoting appreciation, awareness, and demand for local milk among consumers.

MERCADO is undertaking seven activities within three separate focus areas. These activity areas encompass the provision of financial services, training, and capacity building of farmers, extension workers and input and service providers, post-farm gate value chain actors, and to improve the policy and regulatory framework. These activities, detailed in the contract scope of work, are summarized in Exhibit 2. and presented in detail in **Exhibit 105**.

### Exhibit 105. MERCADO Project Activities

| Activity Focus Area | Activity Description                                             |
|---------------------|------------------------------------------------------------------|
| Financial Services  | 1. Facilitate Investment in Dairy Herd Restocking                |
|                     | 2. Facilitate Investment in the Dairy Sector via Innovation Fund |
| Training            | 3. Improved Farm Practices                                       |
|                     | 4. Improved Post-Harvest Handling, Food Safety and Quality       |
| Capacity Building   | 5. Agricultural Extension Agents/Services                        |
|                     | 6. Aggregation and Value-Addition                                |
|                     | 7. Promote Improved Policy and Regulatory Framework              |

#### ***Cyclone Idai***

In March 2019, during the implementation of MERCADO, Cyclone Idai – one of the worst tropical cyclones to affect Africa and the Southern Hemisphere – caused catastrophic damage to Mozambique, Malawi and Zimbabwe. MERCADO supports the dairy value chain in Sofala and Manica provinces, both of which were affected by the cyclone. In Sofala province, the districts of Beira, Dondo and Nhamatanda were the most impacted by the cyclone’s strong winds, heavy rainfall, and ensuing flooding. The cyclone had a catastrophic impact on residents and caused immediate and long-term damage to livestock assets. An estimated 87 dairy cattle under the auspices of the MERCADO project were lost in Manica (37) and Sofala (50); in Sofala this is equivalent to 6% of the dairy herd lost during or in the immediate aftermath of the cyclone, and in Manica this is equivalent to 3% of the dairy herd. Approximately, 102 and 60 MERCADO-supported Sofala and Manica dairy farmers, respectively, lost one or more cattle, dairy infrastructures, equipment, feed supplies, residences or other properties.<sup>105</sup>

Short-run financial impacts to dairy livestock and related assets, including processed product in stock, is estimated at \$250,000. Medium and long-term losses due to increased mortality rates, decreased fertility, reduced milk yield due to stress and disease, poor milk quality, reduced milk collection and reduced market access is expected to be significant. Moreover, MERCADO beneficiaries have lost dairy cattle and essential infrastructure for dairy market development, which will likely influence implementation and achievement of MERCADO’s project objectives.

As part of MERCADO’s midterm evaluation, IMPAQ will assess the effect of the cyclone on MERCADO’s project participants and the dairy value chain in Sofala and Manica. We will also examine how the cyclone influenced project results, including achievement on key indicators outlined in the performance management plan.

#### **Evaluation Objectives**

IMPAQ will work with Venture37 to implement the midterm evaluation of the MERCADO project to measure progress made in achieving the intended outcomes presented in the Results Framework (see **ANNEX B**). The Evaluation Questions and their attendant data collection method and data sources are presented in **Exhibit 106**.

The midterm evaluation has seven objectives, as detailed in the terms of reference (TOR):

- Assess the relevance of the project strategy and approach as well as the validity of assumptions made during project design;
- Measure progress from baseline, including the effectiveness and efficiency of interventions in achieving established targets;

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<sup>105</sup> MERCADO Semi-Annual Performance Report to USDA October 2018 to March 2019

- Assess how women and men have benefited differently from the project;
- Document lessons learned, challenges, and unanticipated effects;
- Identify enablers and constraints to progress (both internal and external factors) that have supported or limited success of the project;
- Assess sustainability efforts to date;
- Provide recommendations for necessary corrections to strengthen project performance, efficiency, and sustainability;
- Provide recommendations for areas of focus for the final evaluation, including reviewing and strengthening data collection systems and metrics in preparation for the final evaluation;
- Assess the effect of Cyclone Idai on MERCADO project participants and the dairy value chain as a whole in both Sofala and Manica provinces; and
- Provide recommendations on the activities that could be discontinued without greatly affecting the project outcomes to account for a reduction in monetization proceeds.

The focus of the midterm evaluation will be to test the hypotheses developed at baseline relating to the project's relevance, impacts, effectiveness, efficiency, sustainability, and gender equality and equity considerations using a non-experimental design, that is, we will compare key outcomes for the various project participants across time.

### **MERCADO Evaluation Team**

To fulfill the evaluation objectives, the MERCADO evaluation team includes:

- ***Lucy Cutting, M.I.D.P., Project Manager and Monitoring and Evaluation (M&E) Advisor.*** Ms. Cutting will lead the evaluation team and provide M&E technical and management oversight of the MERCADO evaluation.
- ***Dr. Uttara Balakrishnan, Ph.D., Technical Lead.*** Dr. Balakrishnan will lead the development of interview protocols and semi-structured surveys, field training procedures, data analysis, and report writing.
- ***Ms. Maria DiFuccia, M.A., Qualitative Lead.*** Ms. DiFuccia will lead the qualitative aspects of this evaluation, including help to facilitate key informant interviews and focus group discussions.
- ***Mr. Reinaldo Penner, M.B.A., Team Lead.*** Mr. Penner will oversee the field data preparation and collection activities in Manica and Sofala.
- ***Mr. Jose Caravela, M.S., Mozambique Dairy Subject Matter Expert.*** Mr. Caravela will provide guidance and support to ensure project quality. He will provide his expertise to data collection and instrument development, describe the dairy sector context to enumerators during their training and help contextualize key findings and reporting.
- ***Diana Herrera, M.S., Research Analyst.*** Ms. Herrera will provide data cleaning and analysis for midterm data.

IMPAQ will collaborate with the Center for Development Management (CDM) to conduct data collection activities.



## EVALUATION METHODOLOGY

In this section, we provide specific details of our mixed methods evaluation approach, including the research questions, quantitative data sources, qualitative data sources and sampling plan, data collection methods, field procedures, quality control measures, and a project timeline.

The IMPAQ team will conduct a performance evaluation to meet the evaluation objectives and answer the evaluation questions presented in the previous section. This approach will frame the evaluation through the lens of Mozambique's dairy market system, considering how MERCADO's interventions contribute to the development of a sustainable private sector driven dairy market system. IMPAQ will use a formative approach to tie together its inquiries at each level of the value chain into a broad picture of MERCADO's relevance, impact, effectiveness, and efficiency and to examine the sustainability and equity of the project's activities and impact.

We will organize the midterm evaluation using a mixed-methods approach, comparing progress on key outcomes over time for project participants. The midterm evaluation will establish a strong basis for the final evaluation by providing a comprehensive documentation of the Beira corridor's dairy market system. It will characterize the different value chain actors – dairy farmers, aggregation and value addition facilities, processors, dairy breeders, input and service providers, student interns, and other stakeholders. The midterm report will test hypotheses about the project's relevance, impact, efficiency, sustainability, and gender equality and equity considerations, which IMPAQ developed at baseline. We will evaluate the project's Results Frameworks within the context of the dairy value chain and will compare the extent to which the strategic objectives of the Results Frameworks have been achieved. The midterm evaluation will build off the initial baseline results and provide a strong basis for the final evaluation by providing longitudinal data and comprehensive documentation of the Beira Corridor's dairy market system, especially after incorporating the effects of Cyclone Idai on project implementation and achievement.

### Research Questions

In pursuing our evaluation objectives, we will answer an array of evaluation questions relating to the project's relevance, impact, effectiveness, efficiency, sustainability, and gender equality and equity. **ANNEX C** demonstrates our evaluation framework, which maps each evaluation question to their attendant data collection method and data sources within each evaluation criteria. At midterm, we will provide current values for the project indicators and other contextualizing data points, compare these values to baseline, and provide preliminary discussions based on our research on potential reasons for the project outcomes achieved thus far and use these insights to make recommendations to refine the project approach.

### Data Sources

IMPAQ will use similar methods and instruments for each type of project stakeholder as used during baseline to generate consistent data and insights over the life of the project. The focus group discussions (FGDs) and key informant interviews (KIIs) will also help contextualize stakeholder insights on the dairy sector as a whole. We will tailor all qualitative interviews and quantitative data collection instruments to each stakeholders' type of involvement in the project. We will discuss with Venture37 any modifications needed in data collection instruments from baseline to account for changes in project implementation. We will include additional questions related to program implementation in quantitative and qualitative instruments for this midterm evaluation.

All data collection instruments and interviews will be designed initially in English; and will subsequently be translated to Portuguese. Data collection personnel will use the most appropriate language for each respondent by selecting the correct language at the start of the survey within the tablet tool.

### **Document Review**

We will review relevant documents from Venture37 which will inform the development of our quantitative and qualitative instruments. These documents include semi-annual performance reports submitted to USDA, special studies conducted by Venture37, and any other relevant documents. This process will also include a review of Venture37 monitoring and evaluation data.

### **Quantitative Data Sources**

The main data sources for the quantitative data collection include a census of dairy farmers, aggregation and value addition facilities (cooperatives), and processors (including microprocessors). We will conduct a panel data survey with dairy farmers and a panel semi-structured survey with cooperatives, processors, and breeders. We will also conduct a cross-sectional semi-structured survey with microprocessors. Exhibit 106 summarizes our proposed target numbers of respondents for the quantitative data collection.

**Exhibit 106. Quantitative Data Sources**

| Stakeholder Type                                       | Data Collection Method                          | Target Sample Size             |
|--------------------------------------------------------|-------------------------------------------------|--------------------------------|
| Dairy Farmers                                          | Panel data survey                               | 284 (Sofala: 133; Manica: 151) |
| Aggregation & Value Addition Facilities (Cooperatives) | Semi-structured survey (quantitative component) | 5 (Sofala: 3; Manica: 2)       |
| Processors (including microprocessors)                 | Semi-structured survey (quantitative component) | 10 (Sofala: 7; Manica: 3)      |
| Breeder                                                | Semi-structured survey (quantitative component) | 1                              |

### **Qualitative Data Sources and Sampling Plan**

We will complement the quantitative data with qualitative data collected from farmers, community-livestock workers (CLWs), processors, cooperatives, student interns, and lecturers. These project beneficiaries will be purposively selected to ensure representation of gender and location.

We will conduct focus group discussions with the dairy farmers. Working closely with local Venture37 staff, farmers will be selected to ensure representation from different scales of production and districts. We will also collect qualitative data from the largest dairy farm in Mozambique which is also involved in breeding activities. Using the contact information given to us by Venture37, we will work with our data collection partner to select a sample that meets our criteria. We will collect qualitative data from all aggregation and value-added facilities and processors during their structured interviews.

We will also interview ancillary beneficiaries, such as lecturers from universities where the project has done outreach, as well as other key stakeholders involved in the implementation of the program and development of policy and regulatory frameworks, including project staff, project partners, and government representatives. The names and contact information for these stakeholders will be provided to us by Venture37. We will work with local Venture37 staff to select the ancillary beneficiaries. All appropriate project staff, partners, and government representatives will be interviewed. **Exhibit 107** summarizes our proposed respondents for the qualitative data collection.

**Exhibit 107. Qualitative Data Sources**

| Stakeholder Type                                       | Data Collection Method                       | Target Sample Size       |
|--------------------------------------------------------|----------------------------------------------|--------------------------|
| Aggregation & Value Addition Facilities (Cooperatives) | Semi-structured survey (interview component) | 5 (Sofala: 3; Manica: 2) |

| Stakeholder Type                       | Data Collection Method                       | Target Sample Size                                                                                         |
|----------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Processors (including microprocessors) | Semi-structured survey (interview component) | 9 (Sofala: 7; Manica: 2)                                                                                   |
| Breeder                                | Semi-structured survey (interview component) | 1                                                                                                          |
| Dairy Farmers                          | Focus group discussions                      | 4 groups of 6-12 participants (Sofala: 1 group; Manica: 3 groups)                                          |
| Community Livestock Workers (CLWs)     | Key informant interviews                     | 5 (Sofala: 2; Manica: 3)                                                                                   |
| Student Interns                        | Key informant interviews                     | 11 (Sofala: 7; Manica: 4)                                                                                  |
| Other Stakeholders                     | Key informant interviews                     | USDA – 2; Project Staff – 4; Government representatives – 4; Lecturers – 2; Producer (Clifton Meadows) – 1 |

## Data Collection Methods

As explained above, we will develop different types of qualitative and quantitative instruments to address research questions for each stakeholder type's involvement in the project or dairy sector and will address overarching issues relating to the project and its activities in the sector. Overall, we will develop a dairy farmer survey, two different semi-structured surveys to cover aggregation and value addition facilities (cooperatives) and processors, qualitative guides for FGDs with dairy farmers and students, and KIIs with CLWs, student interns and other stakeholders, including project partners, project staff and government representatives. IMPAQ will use consistent methods and instruments for each type of project stakeholder across baseline, midterm, and final evaluation data collection to generate consistent data and insights over the life of the project. Please see **ANNEX F** for a list of all data collection instruments.

### Focus Group Discussions

IMPAQ will conduct FGDs with a sub-sample of farmers, where we will ask about their experiences with the MERCADO project, including farming practices; successes and challenges; milk productivity and sales; and unexpected outcomes. These FGDs will include discussion of how participation in MERCADO activities has affected intra-household gender dynamics, including participation of women in productive activities, distribution of the benefits of dairy activity in the household, and women's involvement and influence in household decision-making.

#### Midterm Focus Group Discussion Themes

- Impact of Cyclone Idai on daily activities
- Participation in the dairy value chain
- Successes and challenges faced by dairy farmers – financial, infrastructural, technical
- Plans for future work in dairy/agriculture
- Effect of MERCADO training activities on post-harvest handling, farm management, agricultural productivity, safety and quality practices
- Perceived internal and external factors influenced project activities
- Effect of MERCADO project activities on gender constraints faced by women
- Sustainability of project activities

### ***Key Informant Interviews***

IMPAQ will conduct KIIs with CLWs, student interns, lecturers and other stakeholders, including government representatives, project partners and project staff. The KIIs will include questions about respondents' background, current role in the dairy value chain, perceptions of critical issues in dairy value chain development, viewpoints on MERCADO's strategy and activities, and other specific issues relevant to each type of respondent. The KIIs with CLWs will ask about the impacts and challenges of providing services to farmers. For student interns, we will assess their understanding of and perspective on the potential for a career in the dairy industry and document their experiences with their internships and the MERCADO dairy curriculum. For lecturers, we will ask about their experience teaching the MERCADO curriculum and integrating the dairy module into current livestock and veterinary curriculum, how it compares to what they previously were using, and any suggestions for curriculum improvement.

#### **Midterm Key Informant Interview Themes**

- Impact of Cyclone Idai on the dairy sector
- Current role in the dairy value chain
- Perceptions of critical issues in the dairy value chain
- Perceived internal and external factors influencing project activities
- Effect of MERCADO project activities on gender constraints faced by women
- Likelihood of project targets and outcomes being met by the end of the project
- Sustainability of project activities
- Extent to which resources and activities have efficiently used resources
- Implementation challenges

For project staff and program partners, we will include questions related to the effectiveness and efficiency of activities to examine if there are any activities that could potentially be scaled down or eliminated with minimal program disruption. The KIIs with government representatives will explore the relationship between the program and the government, and if and how the government is helping to strengthen the dairy sector in Mozambique.

### ***Panel Farm Survey***

IMPAQ will modify the baseline panel farm survey to collect data from all current dairy farmers at midterm. The structured survey will collect data on household socio-demographic characteristics and dairy activities, including production and sale of milk. There will also be data collected on the effects of Cyclone Idai, engagement with the MERCADO project, production practices, finance and investments, and animal health services. The farm household survey will also include questions on intra-household distribution of roles and responsibilities in dairy production, allowing nuanced analysis of gender dynamics over the life of the project.

### ***Semi-Structured Surveys***

Data collection for **aggregation and value addition facilities (cooperatives) and processors**, will use semi-structured surveys that IMPAQ will tailor to each type of stakeholder. Each semi-structured survey will include a component to collect basic business information; a quantitative component to collect data on procurement and sales, finance and investments, training, milk quality, labor, equipment, and record keeping; and a qualitative component using key informant interviews to obtain information on respondents' perspective on the dairy value chain and their involvement with the project.

### ***Data Analysis***

We will analyze qualitative and quantitative data separately and then integrate the findings to provide a comprehensive response to the research questions during the midterm evaluation.

### ***Quantitative Data Analysis***

At midterm, we will analyze quantitative data from farmers and other dairy market actors. We will use descriptive statistics such as counts, tabulated proportions, and means. We will also look for common trends and patterns in the data that will inform the evaluation. As significant differences present themselves, we will disaggregate and report these descriptive statistics to reveal differences across project stakeholders based on factors such as gender, scale of operation and location. Additionally, for each PMP indicator we will disaggregate by the sub-group required by the respective indicator. We will also leverage the availability of longitudinal panel data for dairy market actors and project beneficiaries to enable analysis of project outcomes before and after the intervention for the same actor. To examine the linear relationship across time between key project outcomes such as milk yields and sales and explanatory variables such as production practices and socio-demographic factors, we will conduct multivariate regression analysis of the farmer data. To support multivariate analysis, we will use qualitative methods to provide insights into correlations between different practices being used and desired outcomes such as quality and sales to the extent possible. Finally, we will calculate midterm indicator values of key performance indicators and disaggregate them as required in the Performance Monitoring Plan.

### ***Qualitative Data Analysis***

Our qualitative data analysis at midterm will identify and substantiate critical themes and issues that emerge during quantitative data collection. To analyze the qualitative data efficiently, impartially, and consistently, we will have a structured summary form of the interviews and focus groups that identifies key themes and maps them to the evaluation questions outlined in **ANNEX C**. We will synthesize emerging qualitative results using pattern analysis methods that identify themes in responses. Where relevant, we will differentiate results by value chain stakeholder type, as well as by respondents' gender, scale of operations and location.

### ***Integrating Qualitative and Quantitative Data***

The evaluation team will triangulate the qualitative and quantitative analyses to address the evaluation questions. We will compare key findings across both types of data. To overcome any deficiencies in the data, the team will analyze each type of data separately, as described above, and then identify if and how the two sets of findings coincide in the answers they provide to the evaluation questions. Where discrepancies exist, we will consider possible reasons. The team will also use qualitative data, whenever possible, to provide contextual information to help interpret the quantitative results. The process of examining the qualitative and quantitative findings in relation to one another will figure centrally when developing comprehensive lessons learned and recommendations based on the overall evaluation findings.

We will also incorporate a gender-sensitive lens in the midterm evaluation. Through the quantitative farm survey and the FGDs, we will focus on intra-household distribution of roles and responsibilities at the farm level. We will examine how MERCADO project activities affected household-level roles in decision making about dairy activities and control over milk production and revenue from sales. We will explore the perspectives of women and men about the dairy market and related value chain and the constraints and opportunities faced specifically by women. IMPAQ will identify critical gender concerns to address during evaluation design, data collection, and analysis to ensure that gender is an integral part of the MERCADO midterm evaluation. IMPAQ staff will ensure that all evaluation activities appropriately capture and report sex-disaggregated data for outputs and outcomes. We will also employ a gender-sensitive approach throughout our midterm activities by:

- Ensuring that evaluation questions ask specifically about gender inclusiveness, if appropriate
- Disaggregating all data by sex, analyze for gender differences, and report on the findings

- Keeping survey and interview work sensitive to women’s schedules and availability to participate

## Field Procedures

IMPAQ’s local data collection team, led by CDM, will organize and implement field data collection operations, along with the team lead Reinaldo Penner and the qualitative specialist Maria DiFuccia. The team will receive support from Ms. Cutting, Dr. Balakrishnan, and Mr. Caravela.

Following revision and approval of the final inception report and data collection instruments by Venture37 on June 28<sup>th</sup>, 2019, IMPAQ will (1) transmit the final, approved instruments and protocols to the data collection team for translation into Portuguese; (2) program the tablet computers to be used for data collection for the farmer survey; and (3) troubleshoot all instruments.

Mr. Penner and Ms. DiFuccia will travel to Mozambique to participate in and oversee the enumerator training (July 1<sup>st</sup> – July 4<sup>th</sup>, 2019) and pre-testing of the data collection instruments (July 5<sup>th</sup>, 2019). Enumerators will be recruited from local agricultural universities and from CDM’s existing pool of enumerators with specific experience in dairy. Enumerator training, which will take place in Chimoio, will consist of sessions designed to introduce the enumerator team to the evaluation framework and implementation context (including a training on dairy production and marketing concepts reflected in the questionnaires by Mr. Caravela), followed by section-by-section review of data collection instruments and in-class practical application using tablets for the farmer survey. Next will come field-testing of the instruments and protocols, followed by a final in-class session during which enumerators will have an opportunity to address any remaining questions and will be informed of any changes to the instruments or protocols that have resulted from the pre-testing.

Our local data collection partner will use 10 quantitative survey enumerators, 2 supervisors, 1 field manager, and one local qualitative expert. The qualitative expert will conduct KIIs and FGDs with Mr. Penner in Chimoio. The teams will conduct data collection over a 16-day period beginning July 5<sup>th</sup> and ending July 20<sup>th</sup>, 2019. The final update to Venture37 will be sent on July 22<sup>nd</sup>, 2019. Each team will have a supervisor who will provide data quality control (described in the next section); each team will also have two vehicles to ensure timely movement. Because approximately 75 percent of project beneficiaries are in Manica province, both teams will collect data in Manica during the first five days. During the second five days, one team will transfer to Sofala province while the other completes data collection in Manica. Mr. Penner will lead general oversight of field data collection and will conduct key informant interviews and focus group discussions with select value chain respondents. Ms. DiFuccia will conduct key informant interviews with stakeholders, including project staff, partners, and government officials, and will also provide oversight, while consulting with Mr. Penner, to ensure a consistent technical approach and coordination.

## Quality Control Measures

Evidence-quality data is critical to successful evaluations. Ms. Cutting will lead data quality oversight activities for the MERCADO midterm evaluation. The IMPAQ team will use its extensive data collection, management, and validation experience to ensure that the data collected are high-quality. We will also leverage our established and strong working relationship with the data collection team to proactively identify and address any data quality issues that arise during implementation. We have designed our evaluation approach to incorporate multiple measures that will ensure the relevance, reliability, integrity, and accuracy of data we collect. **Exhibit 108** outlines our methods for data collection quality control.



### Exhibit 108. Methods for Data Collection Quality Control

| Quality Controls                           | IMPAQ Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Programming Controls</b>                | Include check-box options for electronic data collection instruments to standardize responses. Provide minimum and maximum values for numeric values. These safeguards will reduce the likelihood of data entry errors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Regular Data Transmission</b>           | Transmit data daily (when possible) to our Washington-based research analyst to allow timely identification and remediation of any data errors or concerns with questionnaire implementation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Recording of Qualitative Interviews</b> | Record interview responses and develop qualitative interview summaries using a standardized template to ensure accurate representation of responses and viewpoints.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Data Quality Checks</b>                 | Work with local team supervisors to lead and conduct field data quality and secondary data quality checks throughout data collection. The team supervisors will conduct data quality checks with 10% of the farmers interviewed during the previous day, using mobile phones to call and ask farmers to repeat their responses on a limited number of the survey questions. These responses will be compared with the survey responses and used to identify problem areas where additional verification and/or remedial training of enumerators is needed. At the beginning of the midterm start-up, IMPAQ home office staff will conduct two initial reviews of quantitative data in the first week for early identification of any data quality issues and will advise accordingly. The data collection team has wireless modems to transmit data by Internet data if a wi-fi upload is not available. |

Oversight of field data collection will involve frequent and open communication between members of the IMPAQ and data collection teams so that we collaboratively identify and mitigate any issues as they arise. The quantitative data collection team will consist of 2 supervisors, 1 field manager, and 10 interviewers. For qualitative data collection, the FGDs and local KIIs will be conducted by Mr. Penner and our local qualitative expert. The KIIs in Maputo with government stakeholders and project staff will be conducted by Ms. DiFuccia.

### Communication Protocol

IMPAQ's midterm evaluation team understands that effective communication with Venture37 Mozambique, DC, and MN offices and the highest level of quality assurance and quality control of all work products and technical deliverables are paramount. IMPAQ's management of the midterm data evaluation and gender analysis will be enhanced by effective, regular communication with Venture37. IMPAQ's "no surprises" policy— which all project managers are required to follow to keep clients regularly and consistently informed about project progress, challenges, solutions, and concerns, ensures that Venture37 will always be fully informed of all relevant project activities and immediately consulted when guidance is needed. The benefit of this policy is that the IMPAQ team and Venture37 will be partners in critical decision-making and problem resolution in all matters. **Exhibit 109** outlines the communication roles and reporting processes that each midterm evaluation team member will have throughout the midterm data collection process:



### Exhibit 109. Communication Roles and Reporting Processes

| Team Member            | Title                           | Communication Role                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Lucy Cutting</b>    | Project Manager and M&E Advisor | <ul style="list-style-type: none"> <li>Main Point of Contact between midterm evaluation team and Venture37.</li> <li>All official communication will be between Ms. Cutting and Venture37.</li> <li>During field work: Check in on a weekly basis, via email and phone, when able, with Venture37 Mozambique's Chief of Party, Fidel O'Donovan, and M&amp;E Manager, Antonio Tovela, and Danielle Niedermaier, Senior Manager – GMEL.</li> <li>Coordinate logistics with Reinaldo Penner, Team Lead.</li> <li>During fieldwork: communicate, in-person and by phone, with Field Team, including Team Lead, Fieldwork Manager, Supervisors, and enumerators to conduct data quality checks.</li> </ul> |
| <b>Reinaldo Penner</b> | Evaluation Team Leader          | <ul style="list-style-type: none"> <li>Main Technical Point of Contact between IMPAQ and Field Team, including Fieldwork Manager, Supervisors, and, if necessary, enumerators, in-person and by phone.</li> <li>Communicate with Venture37 staff on technical issues via email and/or phone.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Jose Caravela</b>   | Mozambique Dairy Expert         | <ul style="list-style-type: none"> <li>Communicate with Project Manager, Evaluation Team Leader, Venture37 Mozambique Staff, Fieldwork Manager, Supervisors and Enumerators on technical issues via in person, email and/or phone.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Jossias Matusso</b> | Fieldwork Manager               | <ul style="list-style-type: none"> <li>Communicate regularly with Venture37 Mozambique staff and extension workers on logistical issues via email, in-person (especially with extension workers), and/or phone.</li> <li>Lead communication with respondent groups for data collection scheduling, location, and other logistics.</li> <li>During fieldwork: communicate with Ms. Cutting and Mr. Penner on a daily basis, in-person and by phone (audio and text), on technical and logistical issues.</li> </ul>                                                                                                                                                                                    |
| <b>CDM</b>             | Field Supervisors               | <ul style="list-style-type: none"> <li>Daily check-ins with Mr. Penner by phone (audio and text).</li> <li>Assist with communication with respondent groups for data collection scheduling, location, and other logistics.</li> <li>Communicate on a regular basis with Ms. Cutting and Mr. Penner by phone (audio and text) regarding data quality checks and issues.</li> </ul>                                                                                                                                                                                                                                                                                                                     |
| <b>CDM</b>             | Field Enumerators               | <ul style="list-style-type: none"> <li>Daily in-person check-ins with Field Supervisors.</li> <li>Periodic in-person check-ins and discussions with Mr. Penner and Ms. Cutting, regarding data quality check and issues.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

#### Reporting

Ms. Cutting will report to Venture37, through an emailed memorandum, throughout the fieldwork, on the following dates and topics:

- Wednesday, July 10, 2019: Summary of Enumerator Training and Finalized Data Collection Plan
- Wednesday, July 17, 2019: Interim report-out of Data Collection activities
- Monday, July 22, 2019: Final report-out of Data Collection activities

This report will be sent to Venture37 Mozambique's Chief of Party, Fidel O'Donovan; M&E Manager, Antonio Tovela; Danielle Niedermaier, Senior Manager – GMEL; and Cooper Hanning, Venture37 Headquarters. Ms. Cutting will also report-in on a regular basis to the Venture37 staff by email if any issues of note arise.

In addition to collecting the Farmer Survey data via tablet and the Cooperative and Processor data via paper, the Field Enumerators who are assisting with other data collection will be required to submit all of their notes and summarized findings to Ms. Cutting, Field Supervisors, and Mr. Penner following data collection to incorporate relevant information into the midterm report. CDM and Mr. Penner will also send final non-survey notes, reports, and summary notes from the interviews and focus groups to IMPAQ staff at the end of the data collection. Ms. Cutting will be responsible for sending all draft and final deliverables to Venture37 according to the contract's deliverables schedule.

### Timeline (activities, responsible party, outputs, and timing)

**Exhibit 110** illustrates the anticipated timeline and responsible entity for the midterm evaluation, contingent on approvals from Venture37 and USDA.

**Exhibit 110. Midterm Evaluation and Timeline**

| Task                                                                                                             | Responsible                   | Due Date                             |
|------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------|
| Review of relevant documents to prepare for inception meeting                                                    | Evaluator                     | May 1 – 10, 2019                     |
| Inception meeting with Venture37 to discuss protocol, methodology, sampling, tools and timeline                  | Evaluator and Venture37 staff | May 10, 2019                         |
| Develop an inception report and develop/update data collection tools                                             | Evaluator                     | May 13 – 24, 2019                    |
| <b>Inception report and tools due to Venture37</b>                                                               | <b>Evaluator</b>              | <b>May 31, 2019</b>                  |
| <i>Venture37 reviews report and tools and provides feedback, comments and suggestions to evaluator</i>           | <i>Venture37</i>              | <i>May 31 – June 7, 2019</i>         |
| Prepare for field work                                                                                           | Evaluator                     | May 31 – June 7, 2019                |
| Finalize tools based on Venture37 Feedback                                                                       | Evaluator                     | June 8 – June 28, 2019               |
| Enumerator training, pretesting, and data collection                                                             | Evaluator                     | July 1 – July 20, 2019               |
| Data entry, cleaning, analysis and report writing                                                                | Evaluator                     | July 22 – August 30, 2019            |
| <b>Draft midterm report submitted to Venture37</b>                                                               | <b>Evaluator</b>              | <b>August 30, 2019</b>               |
| <b>Presentation of evaluation findings to Venture37</b>                                                          | <b>Evaluator</b>              | <b>September 11, 2019</b>            |
| <i>Venture37 reviews draft midterm report and provides evaluator with comments and suggestions for revisions</i> | <i>Venture37</i>              | <i>August 30 – September 6, 2019</i> |
| Finalize report based on Venture37 feedback and prepare all deliverables                                         | Evaluator                     | September 6 – 23, 2019               |
| <b>All Final Deliverables Due (Final midterm report, clean data, photos, and PPT presentation)</b>               | <b>Evaluator</b>              | <b>September 23, 2019</b>            |

**Exhibit 111** below presents the timeline of the fieldwork tasks that will be implemented between July 1<sup>st</sup> through July 22<sup>nd</sup>, 2019.

**Exhibit 111. Midterm Evaluation Fieldwork Timeline**

|                                         | Su   | M | T | W | Th | F | S | Su   | M | T | W  | Th | F  | S  | Su | M  | T  | W  | Th | F  | Su | M  |
|-----------------------------------------|------|---|---|---|----|---|---|------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|
|                                         | June |   |   |   |    |   |   | July |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                                         | 30   | 1 | 2 | 3 | 4  | 5 | 6 | 7    | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 21 | 22 |
| IMPAQ team arrives Chimoio              |      |   |   |   |    |   |   |      |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| Training preparation                    |      |   |   |   |    |   |   |      |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| Train, pilot, test, finalize            |      |   |   |   |    |   |   |      |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| Quantitative and qualitative field work |      |   |   |   |    |   |   |      |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| Close of field activities               |      |   |   |   |    |   |   |      |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| E-mail update to Venture37              |      |   |   |   |    |   |   |      |   |   |    |    |    |    |    |    |    |    |    |    |    |    |

## **ANNEX E. MERCADO FFPR SCOPE OF WORK**

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### **1. Executive Summary**

This document contains the Terms of Reference (TOR) for conducting the baseline, midterm evaluation (MTE), and final evaluation (FE) of the five-year, \$20.5 million MERCADO Food for Progress Program, funded by the United States Department of Agriculture (USDA) and implemented by Venture37 International Development (Venture37) from October 1, 2016 – September 30, 2021. The project is implemented in Manica and Sofala Provinces of Mozambique with the aim to establish a commercial-oriented, sustainable, and competitive dairy market system in Mozambique through reaching USDA's priority objectives of increasing agricultural productivity and expanding trade of agricultural products. Venture37 is updating this TOR for the midterm evaluation. This document includes background information on the MERCADO project, the desired methodology, including objectives and illustrative questions, the timeframe for conducting the evaluations and a list of required deliverables.

To maximize consistency in the evaluation approach and methodology, Venture37 intends to use one evaluator to design and administer the baseline, midterm and final evaluations. The use of one team for all evaluations will provide continuity in the evaluation process. The team will have a deeper understanding of the program and be able to build on each previous evaluation to strengthen subsequent evaluation designs, strategies and findings. Venture37 will work with the same firm for the midterm evaluation as it did for the baseline based on a satisfactory baseline product. Subsequent engagement for the FE will be contingent upon satisfactory completion of the MTE. Venture37 has the discretion to re-solicit the FE, if necessary.

### **2. Background**

#### ***Country Context***

Mozambique has a great potential for dairy production, but following independence in 1975, a 16-year civil war caused the dairy industry to virtually disappear. Historically, the peak in number of dairy cows and milk production was in 1973 with 13,200 cows and 13,020,000 kg of milk produced. Currently, the official statistics place the number of dairy cows at 2,209, of which the provinces of Sofala and Manica (Beira Corridor) comprise 80.4%.

The decrease in number of dairy cows, together with poor management has made the country completely dependent on imports for milk and milk products. In 1992, the contribution of the national production to the total milk and dairy products consumed was 6%, a figure that has remained without major changes 20 years later at 6.4%.

The Strategic Plan for Dairy Development in Mozambique and government interventions so far indicate the Beira Corridor as a priority for the re-establishment of dairy production in the country and the potential for dairy production in Maputo, Zambezia and Nampula. The peri-urban areas of Beira and Chimoio cities, where dairy production is now being re-established by Venture37, are the same areas where dairy farms have been concentrated previously.

#### ***Previous Projects***

In 2008, Venture37 began work to develop the nascent dairy sector in Manica Province, Mozambique with the \$5.3 million Manica Smallholder Dairy Development Project (MSDDP), funded by USDA. Over a forty-two month period, the program supported the rebuilding of the national dairy herd through the purchase,

multiplication and distribution of 513 improved breed dairy cattle. The program also trained more than 1,750 smallholder dairy farmers in feed/fodder techniques, soil conservation and animal husbandry and health, and established 3 producer-level cooperatives and milk collection centers. Additionally, together with partner, Tiller's International, the project built local capacity of over 4,000 farmers in animal traction to increase agricultural productivity.

In September 2012, Venture37 began another USDA funded program, Mozambique Dairy Development Program (MDDP), to intensify their work in Manica and expand to Sofala and Maputo Provinces, with additional support to processors and input providers. Over 3 years, MDDP co-financed 229 improved breed dairy cattle with farmers, trained 5,084 farmers and students in improved animal husbandry practices, and established and trained 10 producer-level cooperatives and 10 milk collection centers in business and quality standards. Additionally, with Tillers International, the project built the capacity of another 14,384 farmers in animal traction.

### **Current Project Description**

The MERCADO program is taking a private sector-driven, market systems approach to transforming Mozambique's dairy sector in Manica and Sofala provinces, so that it is more competitive locally, regionally and nationally. The program continues to build the capacity of dairy producers, cooperatives, and processors to improve their productivity, as well as their milk quality and business practices. It is expanding dairy input service delivery, including extension services, animal health services, and feed and fodder. It is also facilitating access to finance to purchase livestock, production and trade infrastructure, promote private investment in the dairy sector, and strengthening linkages between buyers and sellers. Specifically, the project focuses on seven main activities:

#### ***Activity 1 – Financial Services: Facilitate Investment in Dairy Herd Restocking***

Venture37 is continuing to restock the Mozambican dairy cattle herd by importing dairy cattle and establishing a Dairy Herd Fund (DHF) to enable enterprise-minded farmers to access capital to purchase both imported and local dairy cattle. Commercial breeders can also access this fund to expand their dairy herds and to invest in appropriate reproduction techniques to reduce the need for imported cattle in Mozambique. Venture37 will use the DHF to provide in-kind grants using a scaled match component.

~~Venture37 will use the DHF in a phased approach, starting with in-kind grants using a scaled match component. At the same time, Venture37 will work with and build the capacity of financial institutions to develop appropriate loan products available to interested entrepreneurs to purchase cattle. Venture37 will provide financial institutions a grant from the DHF to establish a pool of capital managed by the financial institutions that creates accessible loan products for farmers.~~

#### ***Activity 2 – Financial Services: Facilitate Investment in the Dairy Sector via Innovation Fund***

Venture37 will develop a Dairy Innovation Fund (DIF) that entrepreneurs, including input and service providers, producers, processors, and retailers, can access to finance equipment, infrastructure and other innovations to expand their businesses. Venture37 will also identify entrepreneurs in input or service provision and link them to the DIF or financial institutions to access finance to develop and grow their enterprises. Venture37 will use the DIF to administer in-kind grants using a scale match component.

#### ***Activity 3 – Training: Improved Farm Practices***

Venture37 is building the capacity of dairy farmers to improve animal health, nutrition and farm business acumen to increase milk production and herd growth. Venture37 is providing on-going support and guidance to dairy farmers on improved feeding and use of appropriate technologies, including fodder

production and animal nutrition. Additionally, Venture37 is providing training to dairy farmers on husbandry, including topics such as breeding, mastitis control, hygiene and animal health. Venture37 is also training farmers in farming as a business, including facilitating linkages between farmers and technology, input and service providers.

#### ***Activity 4 – Training: Improved Post-Harvest Handling, Food Safety and Quality***

Venture37 is helping to improve post-harvest handling to decrease post-harvest loss, focusing on the cold-chain from production to retailers. Venture37 has identified weaknesses in the cold chain to design appropriate training for farmers, cooperatives and processors on post-harvest handling, including topics such as hygiene, quality control, processing and awareness of zoonotic diseases like brucellosis and tuberculosis. Venture37 is providing technical support to processors, who are providing training on post-harvest handling, food safety and quality to cooperatives.

#### ***Activity 5 - Capacity Building: Agricultural Extension Agents/Services***

Venture37 is working with educational institutions, processors, cooperatives, and other input providers to make dairy extension services available to farmers. Venture37 is supporting educational institutions to build a cadre of professionals in the dairy sector, through activities such as integrating dairy into current livestock and veterinary curricula, setting up demonstration farms for training and facilitating dairy internships. Venture37 is continuing to support community livestock workers who are providing guidance and veterinary services to dairy and livestock farmers. Venture37 is also facilitating linkages between the community livestock workers and private or government veterinary services. Venture37 is also supporting processors, cooperatives and other businesses interested in developing appropriate support services and inputs to farmers. Venture37 is also supporting the establishment of local breeders to provide an in-country supply of dairy cattle. This support is building their dairy breeding skillsets and help breeders explore the effectiveness of various breeding technologies.

#### ***Activity 6 - Capacity Building: Aggregation and Value- Addition***

Venture37 is increasing market access by supporting milk bulking and value addition in local businesses. Venture37 is working with existing milk bulking businesses, such as cooperatives, to enhance growth and profitability. Venture37 is also exploring and implementing alternative milk bulking models, such as working with dairy farmers, private businesses and processor-owned bulking facilities. Venture37 is supporting these businesses to expand into areas such as cold chain management, processing and retail opportunities. These opportunities could include developing transport systems, purchasing processing equipment to process the milk on site, and creating milk kiosks to sell directly to customers. Venture37 is also training youth on nutrition, food safety and dairy quality to promote consumption of dairy products. Venture37 is facilitating a marketing campaign to stimulate alternative markets through promotion of locally produced milk products.

#### ***Activity 7 - Capacity Building: Promote Improved Policy and Regulatory Framework***

Venture37 and key dairy sector stakeholders, including dairy producers, cooperatives, processors, input and service providers, and private sector investors are working with the government to examine the current policy and regulatory framework in order to identify barriers to growth in the dairy industry and recommend effective solutions. Based on the results, Venture37 is supporting capacity building and networking opportunities for key government staff and other stakeholders to increase their ability to strengthen the Mozambican dairy sector. Through a consultative process, Venture37 is also facilitating the development of a private-sector-led representative body for the dairy sector to support the needs of the dairy industry, including helping them to develop their mission statement and strategy. The entity is

engaging the Government of Mozambique to advocate for reforms in the policy and regulatory framework to support growth and investment in the dairy sector.

### **3. Evaluation Design**

#### ***Purpose and Objectives of the Evaluation***

The purpose of the baseline, MTE, and FE are to analyze and document the extent to which the program has achieved its goals and objectives and to explain any deviations from the plan (See Annex 1 & 2 for the results framework and key outcome indicators). The baseline will also contain an initial gender analysis that will not be a part of further evaluations. Specific objectives for each evaluation are listed below:

#### **Baseline Objectives**

The baseline evaluation will:

- Understand the current state of key dairy actors, including demographics, socioeconomic status, businesses finances, and dairy-related practices and technologies;
- Understand the gender constraints and opportunities and make recommendations to ensure that both sexes are equally able to participate and benefit from the project;
- Establish the project baseline values;
- Provide recommendations for setting and refining targets for project indicators in accordance with the findings;
- Identify potential strengths, weaknesses, opportunities and threats to project implementation in the target areas;
- Develop strategies to maximize strengths and mitigate challenges; and
- Generate data to be used for comparative analysis across the life of the project to measure change.

#### **Midterm Evaluation Objectives**

The mid-term evaluation will:

- Assess the relevance of the project strategy and approach as well as the validity of assumptions made during project design;
- Measure progress from baseline, including the effectiveness and efficiency of interventions in achieving established targets;
- Assess how women and men have benefited differently from the project;
- Document lessons learned, challenges and unanticipated effects;
- Identify enablers and constraints to progress (both internal and external factors) that have supported or limited success of the project;
- Assess sustainability efforts to date;
- Provide recommendations for necessary corrections to strengthen project performance, efficiency and sustainability; and
- Provide recommendations for areas of focus for the final evaluation, including reviewing and strengthening data collection systems and metrics in preparation for the final evaluation.
- Assess the effect of cyclone Idai on MERCADO project participants and the dairy value chain as a whole in both Sofala and Manica provinces.
- Provide recommendations on the activities that could be discontinued without greatly affecting the project outcomes; to account for a reduction in monetization proceeds.

#### **Final Evaluation Objectives**

The final evaluation will:

- Assess whether the project has achieved the expected results as outlined in the results frameworks (see Appendix A);
- Assess the relevance, effectiveness, efficiency, impact and sustainability of project activities;
- Measure progress from baseline and midterm and assess attribution to the extent possible;
- Assess how women and men have benefited differently from the project;
- Identify lessons learned through the duration of the project with an emphasis on identifying key strategies, methodologies and factors that contributed to and/or inhibited success, focusing on areas that could be applied to similar programming; and,
- Draw conclusions and provide recommendations to Venture37, USDA, project participants, project partners and other stakeholders including the Government of Mozambique, and USDA Washington to strengthen future or similar projects.

#### Evaluation Questions

The evaluation will answer the following key questions within the standard evaluation criteria:

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Relevance</b> | <p>Does the results framework, assumptions, program design and project activities meet the needs of the participants and local conditions in Mozambique's Manica and Sofala Provinces?</p> <p>How well aligned are MERCADO's strategy and activities with the development goals, objectives and strategies of USDA, the U.S. Government and the Mozambican Government?</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Impacts</b>   | <p>What impacts are the project activities having on the program participants, both positive and negative, especially in relation to the expected results and strategic objectives?</p> <ul style="list-style-type: none"> <li>○ How has the project-provided training impacted the knowledge and uptake of improved agricultural, farm management practices and post-harvest handling?</li> <li>○ How has the use of improved practices affected agricultural productivity, (<i>measured through liters of milk per day, number of days of lactation, and calving interval for dairy and through yield for forage</i>)?</li> <li>○ To what extent has increased access to input suppliers affected the uptake of improved agricultural techniques, farm management practices, post-harvest handling, and use of improved infrastructure for farmers?</li> <li>○ How has training in improved safety and quality affected the rate of rejection of milk at the aggregation level?</li> <li>○ How have project activities influenced total value and quantity of milk and milk product sales?</li> <li>○ How is value-capture distributed across different milk market system actors? What can be done to improve value capture and profitability of the actors?</li> <li>○ To what extent has access to finance affected the growth of farmer dairy businesses?</li> <li>○ To what extent has access to finance affected uptake of improved processing techniques, quality standards, and improved infrastructure for processors?</li> </ul> <p>What internal and external factors have influenced the ability of the project to meet expected results and targets?</p> |



|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   | How did cyclone Idai influence the program's results?                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Effectiveness</b>              | To what extent are the program targets and outcomes likely to be achieved by the end of the project?<br>What key successes should be replicated or key improvements should be made to the implementation to maximize the results?                                                                                                                                                                                                                     |
| <b>Efficiency</b>                 | Were the resources and activities provided by the program carried out in a timely manner and with effective use of resources?<br>How well has the project been managed and M&E data used to make programmatic decisions?                                                                                                                                                                                                                              |
| <b>Sustainability</b>             | <ul style="list-style-type: none"> <li>• Which project activities and benefits are likely to be sustained or not sustained past the project lifespan, why?</li> <li>• What exit strategy has the project put into place to ensure the sustainability of the project outcomes?</li> <li>• What activities could the project scale down or eliminate and not affect project outcomes; to account for reduction in monetization proceeds?</li> </ul>     |
| <b>Gender Equality and Equity</b> | <ul style="list-style-type: none"> <li>• How did the project address the constraints faced by women in the dairy sector?</li> <li>• What did the program do to ensure participation of both men and women? What could the program have done better?</li> <li>• How did the outcomes of the project differ between men and women? What could the project have done differently to ensure that equal benefits accrued to both women and men?</li> </ul> |

### Evaluation Methodology

The project evaluation should be carried out in a participatory manner that actively seeks partner, participant, and stakeholder feedback. The evaluation will use a non-experimental design, comparing progress on key outcomes over time for project participants – dairy farmers, Cooperatives/MCCs, processors, students, breeders, and input and service providers. Quantitative and qualitative data will be collected from program participants by external evaluators at baseline, midterm, and final evaluation. This will be supplemented with data collected by project staff semi-annually, and monitoring data collected throughout project implementation. While an experimental design would be preferable for ensuring attribution, it is not possible for this evaluation to use a counterfactual, since the dairy industry in Mozambique is nascent and it is essential that the project work with all dairy producers and enterprises that are interested in participating.

This section details the type of data expected to be collected from stakeholders to answer the key evaluation questions. A summary of the data collection methods relevant to this TOR can be found below. The current sample frame for the midterm evaluation is 290 dairy producers with 1,966 dairy cows, 9 processors (2 processors and 7 micro-processors), 4 Milk Kiosks (3 cooperative-owned and 1 privately-owned), 6 cooperatives, all of them owning MCCs, 1 dairy breeder and 1 potential dairy breeder, 22 CLWs, 28 student interns, 209 students trained in technical schools, and 1,207 youth, teachers and staff trained in nutritional value of milk.

| Stakeholder                             | Data Collection Method  | Timing   |         |         |
|-----------------------------------------|-------------------------|----------|---------|---------|
|                                         |                         | Baseline | Midterm | Endline |
| Dairy Farmers                           | Farm Survey             | X        | X       | X       |
|                                         | Focus Group Discussions | X        | X       | X       |
| Aggregation & Value Addition Facilities | Financial Data          | X        | X       | X       |
|                                         | Key Informant Interview | X        | X       | X       |
| Processors                              | Financial Data          | X        | X       | X       |
|                                         | Key Informant Interview | X        | X       | X       |
| Dairy Breeders                          | Key Informant Interview | X        | X       | X       |
| Input and Service Providers             | Surveys or Interviews   | X        | X       | X       |
| Student Interns                         | Key Informant Interview | X        | X       | X       |
| Other Stakeholders                      | Key Informant Interview | X        | X       | X       |

**Dairy Farmers:** Quantitative data will be collected from all dairy farmers throughout project implementation as a panel study. At baseline, midterm, endline, data will be collected from dairy farmers through a farm questionnaire to assess their current dairy practices, lactation volumes and length, calving intervals, milk sales and costs, hired labor, forage establishment and yields, and other related information. Since the population of dairy farmers is relatively small, the entire population will be surveyed at baseline, midterm and final evaluation. The population at midterm and final evaluations are expected to be smaller than the baseline study because some farmers may decide to sell their cows. Additionally, the project may also gradual stop working with small-scale dairy farmers to focus on building capacity of farmers with larger amounts of cattle. Farmers who continue to own livestock, even after the project has stopped providing support, will continue to be included in the panel study at midterm and final evaluation in order to assess sustainability of knowledge and perceptions after the project support is complete. A small group of individuals who no longer own cows will participate in the key informant interviews to understand the common challenges and/or barriers to cattle ownership.

Qualitative data will also be collected from dairy farmers through focus group discussions at baseline, midterm, endline in each of the provinces. The focus group discussions will provide context to the quantitative data to describe why dairy farmers are or are not changing their agricultural practices, how they are engaging with the aggregation centers and processors, feedback on their experience with the project, and gender considerations.

**Aggregation and Value Addition Facilities:** Milk from individual farmers is currently bulked at Milk Collection Centers (MCCs), owned by cooperatives. The project will work with current viable aggregation facilities and explore other opportunities for aggregation and value addition. The evaluations will use production and financial data collected by the aggregation and value addition facilities, including the volume of milk collected, rejection rate of milk at aggregation level and at processor level, proceeds from milk sales, and costs of aggregation.

The evaluation will also collect quantitative and qualitative information from the aggregation and value addition facilities through structured key informant interviews to understand changes they have made to their governance structure, post-harvest handling practices, successes and challenges, feedback on how to improve program activities, and gender considerations.

**Processors:** Processors will share certain production and financial data for the evaluation, including the amount of milk collected from project-supported farmers and aggregation facilities, and total sales of milk products. For some of the smaller micro-processors, project staff will provide ongoing capacity building to collect this information and follow-up at least monthly to ensure its validity.

The evaluation will also collect quantitative and qualitative data through structured key informant interviews with each of the processors to understand changes they have made to their processing practices, other services they are providing to smallholder farmers, such as feed and technical assistance, successes and challenges in their current functioning, suggestions for project improvement, and gender considerations.

**Input & Service Providers:** The evaluation will conduct key informant interviews or surveys at baseline, midterm and final evaluation with dairy input and service providers supported by the project, including breeders, community livestock workers, etc. These surveys or interview will help to understand the how they have participated in the project, the financials and viability of their businesses, challenges and successes, suggestions for improvement, and gender considerations.

**Other Key Stakeholders:** The evaluation will conduct key informant interviews at baseline, midterm, and final evaluation with other key dairy stakeholders, student interns, government vets, local leaders, members of dairy sector representative body, government officials and program staff to understand how they have participated in the project, challenges and successes, suggestions for improvement, and gender considerations.

**Monitoring Data:** In addition to the data described above, the evaluation will also use monitoring data collected by project staff at every project event throughout implementation. Monitoring data will include training details and attendance, co-financing provided and the products purchased, periodic financial and production reports from aggregation/value addition facilities and processors.

### ***Analysis***

Quantitative data from dairy farmers will be analyzed through direct comparison between baseline (since we are interviewing the same dairy actors) to understand the changes in key indicators that occurred over time. Financial data from the aggregation/ value addition facilities and processors will be compared over time and analyzed to understand value capture and profitability. Qualitative data will be transcribed and analyzed by theme.

## **4. Key Tasks**

For each of the baseline, midterm, and final evaluations, these key activities must be completed:

**Review of Documents:** Undertake review of the MERCADO program documents, previous Mozambique program documents, and other relevant documents that are available at the time, including, but not limited to, the following:

- Project agreement with USDA including the MERCADO scope of work
- MERCADO Evaluation Plan
- MERCADO Performance Management Plan (PMP)
- MERCADO Internal Performance Monitoring, Evaluation and Learning Plan (PMELP)
- Semi-Annual and Annual Data collected internally (at Midterm and Final Evaluation)

- Monitoring data (at Midterm and Final Evaluation)
- Baseline report & data collection tools (at Midterm and Final Evaluation)
- Midterm report & data collection tools (at Final Evaluation)
- Special Studies conducted throughout implementation (at Midterm and Final Evaluation), including Barriers to Growth of the Mozambique Milk Market, Financial Services Study, Dairy Breeding Desk Study, Dairy Cattle Breeding Policy Study, Assessment of Opportunities for Alternative Aggregation Models, and Input and Service Provision Study.
- Semi-annual reports submitted by Venture37 to USDA (at Midterm and Final Evaluation)
- Final Evaluations of the two previous Mozambique Dairy Programs
- Any other program documents which will enable the evaluator to get acquainted with the project progress
- Relevant Government of Mozambique reports and documents for background information and establishing the socio-economic and political context in which MERCADO occurred

Refinement of methodology and data collection tools: The evaluator, in close collaboration with the Venture37, will do the following:

- Develop/revise a finalized methodology to carry throughout the three evaluations, including a sampling frame, sampling technique and sample sizes for both quantitative and qualitative surveys that is consistent with the desired methodology in this TOR
- Develop/revise data collection tools for both quantitative and qualitative data collection, including tools for gender analysis at baseline. Surveys should be comparable throughout the three studies to ensure comparability of data over time, but additional questions should be added or tools created at MTE/FE to explore participation in the project activities, and to ensure all evaluation questions, described above, are answered.
- Based upon a reading of the program documents, propose any additional topics or issues for analysis prior to conducting each evaluation.

#### Field Data Collection

- Plan and coordinate the necessary logistics to collect the data in accordance with the selected methodology.
- Pre-test, edit, translate, finalize and reproduce the survey instruments.
- Train and orient enumerators and data collection team.
- Carry out the fieldwork using own transportation, including household surveys, focus group discussions, and interviews with key informants such as processors, input providers, breeding farmers, government, local leaders and Venture37 program staff.

#### Data entry, analysis and reporting

- Enter, clean, synthesize, analyze, and interpret data from both the quantitative surveys and the qualitative protocols using approved statistical packages.
- Prepare a draft final evaluation report, including a discrete section for the gender analysis at baseline, addressing the objectives and questions of this evaluation outlined in this TOR and recommendations on the overall Venture37/FFPr MERCADO project for potential similar future project for review by Venture37 staff and stakeholders.

- Develop a PowerPoint presentation of evaluation findings, present and submit to Venture37 and stakeholders.
- Prepare a final evaluation report that includes revisions based on feedback on the draft report and presentation.

## 5. Timeframe

The anticipated midterm evaluation timeline is provided below. The midterm evaluation is expected to commence May 1, 2019. The final evaluation will occur around April – June 2021.

### Midterm Evaluation

| Task                                                                                                             | Responsible                   | Due Date                             |
|------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------|
| Review of relevant documents to prepare for inception meeting                                                    | Evaluator                     | May 1 – 10, 2019                     |
| Inception meeting with Venture37 to discuss protocol, methodology, sampling, tools and timeline                  | Evaluator and Venture37 staff | May 10, 2019                         |
| Develop an inception report and develop/update data collection tools                                             | Evaluator                     | May 13 – 24, 2019                    |
| <b>Inception report and tools due to Venture37</b>                                                               | <b>Evaluator</b>              | <b>May 24, 2019</b>                  |
| <i>Venture37 reviews report and tools and provides feedback, comments and suggestions to evaluator</i>           | <i>Venture37</i>              | <i>May 24 – 31, 2019</i>             |
| Prepare for field work                                                                                           | Evaluator                     | May 24 – 31, 2019                    |
| Finalize tools based on Venture37 Feedback                                                                       | Evaluator                     | June 3 – 7, 2019                     |
| Enumerator training, pretesting, and data collection                                                             | Evaluator                     | June 26 – July 14, 2019              |
| Data entry, cleaning, analysis and report writing                                                                | Evaluator                     | July 15 – August 30, 2019            |
| <b>Draft midterm report submitted to Venture37</b>                                                               | <b>Evaluator</b>              | <b>August 30, 2019</b>               |
| <b>Presentation of evaluation findings to Venture37</b>                                                          | <b>Evaluator</b>              | <b>September 4, 2019</b>             |
| <i>Venture37 reviews draft midterm report and provides evaluator with comments and suggestions for revisions</i> | <i>Venture37</i>              | <i>August 30 – September 6, 2019</i> |
| Finalize report based on Venture37 feedback and prepare all deliverables                                         | Evaluator                     | September 6 – 23, 2019               |
| <b>All Final Deliverables Due (Final midterm report, clean data, photos, and PPT presentation)</b>               | <b>Evaluator</b>              | <b>September 23, 2019</b>            |

## 6. Required Deliverables

For each of the baseline, MTE, and FE, the deliverables under this consultancy are listed below. This table indicates the due dates for the deliverable for the midterm. A similar table will be developed for the FE in consultation with the selected contractor.

| Deliverable                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Due Date        |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Inception Report                | Report should describe the following: <ul style="list-style-type: none"> <li>- Understanding of the project based on project documents and literature review</li> <li>- Finalized methodology including detailed sampling plan and field procedures</li> <li>- Quality control measures</li> <li>- Communication protocol</li> <li>- Finalized timeline (activities, responsible party, outputs, and timing)</li> <li>- Draft Data collection tools</li> </ul> | May 24, 2019    |
| Draft midterm evaluation report | The report should be submitted in English addressing all the evaluation objectives and questions listed in the scope of work. The baseline report should also include a separate section for the gender analysis.                                                                                                                                                                                                                                              | August 30, 2019 |

| Deliverable                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Due Date           |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| PowerPoint Presentation             | Presentation should include an abbreviated list of evaluation findings that can be presented to relevant internal and external stakeholders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | September 4, 2019  |
| Final Data Collection Tools         | Electronic copies of all clean and final English-version of data collection tools                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | September 23, 2019 |
| Final Cleaned Data                  | Clean and final English versions of: <ul style="list-style-type: none"> <li>- quantitative data sets in Microsoft-Excel <u>and</u> any other utilized format (SPSS, STATA, etc)</li> <li>- qualitative transcripts, field and interview notes, complete list of key informant interviews and FGDs in Microsoft-Word document</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | September 23, 2019 |
| Final version of the midterm report | Electronic copy of the midterm evaluation report should be submitted in English in both Microsoft- Word and PDF version.<br><br>Report should include the following sections: <ol style="list-style-type: none"> <li>Acknowledgements</li> <li>List of Acronyms and abbreviations</li> <li>Table of Contents</li> <li>Executive Summary (no longer than two pages)</li> <li>Background (Program description and purpose of baseline)</li> <li>Methodology and Implementation</li> <li>Results and Findings (in accordance with the objectives)</li> <li>Gender Analysis</li> <li>Recommendations (for future similar project)</li> <li>Annex: Table of key program indicators with updated values in comparison to baseline values (for the midterm and final evaluations)</li> <li>Annex: Results Frameworks</li> <li>Annex: Scope of Work for the evaluation</li> <li>Annex: Inception Report for the evaluation</li> <li>Annex: Survey Instruments: questionnaire(s), survey(s), interview protocol(s), focus group discussion protocol(s)</li> </ol> | September 23, 2019 |
| High-Quality Photos                 | 10-15 high-quality pictures of the process                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | September 23, 2019 |

Please note that a draft evaluation report that does not meet Venture37 expectations in terms of quality will not be accepted.

## 7. Relationships and Responsibilities

Venture37 intends to contract with the same organization for the baseline, midterm, and final evaluation if the previous study deliverables meet expectations. In the event that Venture37 expectations are not met, a new competitive recruitment process will be completed in alignment with USDA policies. The evaluation firm will be financially and legally independent of Venture37 and its partners to ensure evaluation validity.

The evaluator will perform the tasks described in this TOR with support from MERCADO staff members, assigned by the Chief of Party, to provide relevant documents and information and to locate participants and stakeholders. The evaluation team will communicate with the MERCADO Monitoring & Evaluation Manager and the headquarters MEL Senior Manager, and keep them informed of their progress. Venture37 staff and stakeholders will provide feedback on the inception report, data collection tools and draft report. During the evaluation, the evaluator may ask for additional advice or guidance from the above-mentioned Venture37 staff, but the evaluator should conduct the evaluation with independence and impartiality.

Venture37 Global Monitoring Evaluation and Learning (GMEL) team, based in the Venture37 headquarter office, will give the final approval on all evaluation deliverables and will work closely with the Mozambique MEL team to ensure the deliverables are reviewed and shared among relevant staff and stakeholders.

#### **8. Logistics**

The assignment will require travel to targeted program regions of Manica and Sofala Provinces. All resources (e.g. interpreters, enumerators, transport, hotel reservations) should be arranged by the evaluator.

#### **9. Resulting Contract**

Venture37 intends to issue a firm fixed-price contract for the midterm evaluation. Subsequent contracts for the final evaluation will be considered based on satisfactory performance of all contract terms.



## ANNEX F. SURVEY INSTRUMENTS

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### MERCADO MIDTERM FARMER SURVEY

#### SECTION 0. BASIC INFORMATION

**[Enumerator Instruction]:** Please fill these questions prior to asking for consent from the respondent.

| VARIABLES                  | INTRODUCTION AND SURVEY ID                                                                                                                                                                                                                                                                                                                                                  | ENUMERATOR INSTRUCTIONS                        | PMP INDICATOR |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------|
| sc0_1_1_LON<br>sc0_1_1_LAT | GPS coordinates                                                                                                                                                                                                                                                                                                                                                             |                                                |               |
| sc0_3_1                    | Province<br>6 Manica<br>7 Sofala                                                                                                                                                                                                                                                                                                                                            | *Select only one option                        |               |
| sc0_3_2                    | District<br>61 Gondola<br>62 Macate<br>63 Sussundenga<br>64 Vanduzi                                                                                                                                                                                                                                                                                                         | *Select only one option<br>*Ask if sc0_3_1 = 6 |               |
| sc0_3_3                    | Community<br>611 Amatongas Centro<br>612 Amatongas Socel<br>613 Bengo<br>614 Cafumpe<br>615 Francisco Manyanga<br>616 Ganhira<br>617 Gondola Sede<br>618 Maforga<br>619 Mazicuera<br>6110 Mudima<br>6111 Zippinga<br>6112 Belas<br>6113 Chigodole<br>6114 Chimoio<br>6115 Chirimera<br>6116 Chitanaque<br>6117 Chitundo<br>6118 Cruzamento<br>6119 Macadeira<br>6120 Marera | *Select only one option<br>*Ask if sc0_3_1 = 6 |               |

|                             |                                                                                                                                                                                                                                                                                                     |                                                |  |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--|
|                             | 6121 Matsinho<br>6122 Matsinho/Chirimera<br>6123 Nhademba<br>6124 Nhamakamba<br>6125 Sussundenga<br>6126 Vanduzi<br>6127 Zembe 1<br>6128 Zembe 4<br>98 Other                                                                                                                                        |                                                |  |
| <b>sc0_3_3_OTH<br/>ER</b>   | Other, please specify                                                                                                                                                                                                                                                                               | *Ask if sc0_3_3 = 98                           |  |
| <b>sc0_3_3_1</b>            | District<br>71 Buzi<br>72 Caia<br>73 Chemba<br>74 Cheringoma<br>75 Chibabava<br>76 Dondo<br>77 Gorongosa<br>78 Marromeu<br>79 Machanga<br>710 Maringue<br>711 Muanza                                                                                                                                | *Select only one option<br>*Ask if sc0_3_1 = 7 |  |
| <b>sc0_3_3_2</b>            | Community<br>711 Nhangau<br>712 Manga - Mascarenha<br>713 N'dunda II<br>714 Canhandula<br>715 Inhamizua<br>716 Matadouro<br>717 Ceramica<br>718 Mandruzi<br>719 Nhamainga<br>7110 Balanca<br>7111 Macharote<br>7112 Consito<br>7113 Mafarinha<br>7114 Jasse – Estacao<br>7115 Metuchira<br>98 Other | *Select only one option<br>*Ask if sc0_3_1 = 7 |  |
| <b>sc0_3_3_2_O<br/>THER</b> | Other, please specify                                                                                                                                                                                                                                                                               | *Ask if sc0_3_3_2 = 98                         |  |
| <b>sc0_3_4</b>              | Respondent number (from list)                                                                                                                                                                                                                                                                       | *Enter from pre-populated list                 |  |

|                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                |  |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--|
| sc0_3_5                                                                                                      | Household head full name (from list)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | *Enter from pre-populated list |  |
| <b>[Enumerator Instruction]: Please read the informed consent script and obtain consent from respondent.</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                |  |
| sc0_2_1                                                                                                      | <p><i>(Introduction)</i> Hello, my name is ____ and I am part of a team hired by Land O'Lakes to conduct a survey regarding dairy production. May I speak with one of the heads of household, preferably someone who has participated in dairy production on your farm?</p> <p><i>Present letter of introduction.</i></p> <p>With your permission, I would like to ask you questions about your household and your dairy activities. This will improve our understanding of dairy activities in the area and the households that work in dairy, helping Land O'Lakes to better support the sector. This study will be conducted with all dairy producers in the area supported by Land O'Lakes. Your answers will be kept confidential and will not be used for any purpose other than in a report that will help inform the dairy project being implemented by Land O' Lakes.</p> <p>The interview should last about an hour. Participation is voluntary and you can choose not to take part. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer. Land O'Lakes would like you to feel free to be open and honest in your responses. Knowing the true situation in your dairy production activities will help them provide better support to you in the future. There are no penalties to you for not participating or not answering a question. Neither your participation nor your responses will affect your ability to receive Land O'Lakes assistance now or in the future.</p> |                                |  |

|         |                                                                                                                                                                                                                                            |                         |  |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--|
|         | <p>Do you have any questions about any of the things I have just said?</p> <p>1 If yes → <b>answer questions from respondent</b></p> <p>2 If no → <b>continue to next question</b></p>                                                     |                         |  |
| sc0_2_2 | <p>Are you willing to participate in this interview?</p> <p>1 Yes</p> <p>2 No → <b>thank respondent for his/her time and conclude interview</b></p>                                                                                        | *Select only one option |  |
| sc0_4_1 | <p>Result of the survey: 1st attempt</p> <p>1 Start of inquiry</p> <p>2 Interview declined / not granted</p> <p>3 The person being asked is not available</p> <p>4 Requested additional information</p> <p>5 Organized a new interview</p> | *Select only one option |  |
| sc0_4_2 | <p>Result of the survey: 2nd attempt</p> <p>1 Start of inquiry</p> <p>2 Interview declined / not granted</p> <p>3 The person being asked is not available</p> <p>4 Requested additional information</p> <p>5 Organized a new interview</p> | *Select only one option |  |
| sc0_4_3 | <p>Result of the survey: 3rd attempt</p> <p>1 Start of inquiry</p> <p>2 Interview declined / not granted</p> <p>3 The person being asked is not available</p> <p>4 Requested additional information</p> <p>5 Organized a new interview</p> | *Select only one option |  |

## **SECTION 1: HOUSEHOLD CHARACTERISTICS**

**[Transition]:** Enumerator: Thank you for agreeing to participate in the survey. To begin, we will ask general questions about you and your household.

| VARIABLES | HOUSEHOLD CHARACTERISTICS<br>(SOCIO-ECONOMIC PROFILE)    | ENUMERATOR INSTRUCTIONS | PMP INDICATOR |
|-----------|----------------------------------------------------------|-------------------------|---------------|
| sc1_1_0   | <p>You are the representative of:</p> <p>1 Household</p> | *Select only one option |               |

|                      |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                               |                                     |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
|                      | 2 An organization<br>3 A company                                                                                                                                                                                                                                                                    | *Explain: An organization could be larger farms, such as schools and orphanages operating dairy farm<br>*Explain: A company refers to a commercially oriented farm enterprise |                                     |
| <b>sc1_1_0_1</b>     | Please specify name                                                                                                                                                                                                                                                                                 | *Ask if sc1_1_0 = 2 OR sc1_1_0 = 3                                                                                                                                            |                                     |
| <b>sc1_1_1</b>       | Full name of respondent                                                                                                                                                                                                                                                                             |                                                                                                                                                                               |                                     |
| <b>sc0_3_5</b>       | Contact information (cell phone)                                                                                                                                                                                                                                                                    | *Enter 10-digit number                                                                                                                                                        |                                     |
| <b>sc1_1_2</b>       | Gender of respondent<br>1 Male<br>2 Female                                                                                                                                                                                                                                                          | *Select only one option<br>*Do not ask, just enter                                                                                                                            | INDICATORS:<br>#7 - #13; #16 - #18; |
| <b>sc1_1_3</b>       | Respondent's age in years                                                                                                                                                                                                                                                                           | *Enter in years<br>*Enter -99 if Do not know/refuse to answer age                                                                                                             |                                     |
| <b>sc1_1_4</b>       | Respondent's relationship to household head<br>1 Self<br>2 Spouse<br>3 Daughter<br>4 Son<br>5 Relative living in the house<br>6 Farm labor/employee<br>7 Other                                                                                                                                      | *Select only one option                                                                                                                                                       |                                     |
| <b>sc1_1_4_other</b> | Other, please specify                                                                                                                                                                                                                                                                               | *Ask if sc1_1_4 = 7                                                                                                                                                           |                                     |
| <b>sc1_1_5</b>       | (Respondent's educational background) Highest level of schooling completed<br>1 Primary of first grade (1st - 5th class)<br>2 Primary of the second degree (6th - 7th class)<br>3 Secondary of the first grade (8th-10th class)<br>4 Secondary school (11th-12th class)<br>5 Technical-Professional | *Select only one option<br>*Explain: did not complete any degree implies the person went to post-graduate studies/university but did not finish them.                         |                                     |

|                |                                                                                                                                                                                                                                                                             |                                                                                                                                                  |  |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                | 6 University and postgraduate studies<br>7 Did not complete any degree<br>8 No schooling<br>-99 Do not know/refuse to answer                                                                                                                                                |                                                                                                                                                  |  |
| <b>sc1_2_1</b> | How many people usually live in this household including yourself and any visitors residing for 6 or more months?                                                                                                                                                           | *Ensure that the respondent includes himself/herself and any child who has not yet been registered<br>*Enter -99 if do not know/refuse to answer |  |
| <b>sc1_3_1</b> | What is the main material of the floor of the residence (excluding kitchen and bathrooms)?<br>1 With nothing, or other materials not mentioned below<br>2 Adobe (matope), wood/parquet, marble/granite, cement, or mosaic/tile<br>-99 Do not know/refuse to answer          | *Select only one option                                                                                                                          |  |
| <b>sc1_3_2</b> | What is the main material of the walls of the residence?<br>1 Cane/sticks/bamboo/palm tree, wood/zinc, tin/cardboard/paper/ba /shell, other<br>2 Block of adobe/raw blocks, staked sticks (stick to pike)<br>3 Block of cement or brick<br>-99 Do not know/refuse to answer | *Select only one option                                                                                                                          |  |
| <b>sc1_3_3</b> | What toilet arrangement does the household use in its residence?<br>1 None or other (facilities not mentioned)<br>2 Latrine (of any type)<br>3 Toilet connected to the septic tank<br>-99 Do not know/refuse to answer                                                      | *Select only one option                                                                                                                          |  |

|                                                                                          |                                                                                                                                                                                                                                     |                                                       |  |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--|
| <b>sc1_3_4</b>                                                                           | What is the main source of energy for lighting in the residence?<br>1 Firewood, or batteries<br>2 LPG, oil/paraffin/kerosene, or candles<br>3 Electricity, generator, or solar panel<br>4 Other<br>-99 Do not know/refuse to answer | *Select all that apply                                |  |
| <b>sc1_3_4_other</b>                                                                     | Other, please specify                                                                                                                                                                                                               | *Ask if sc1_3_4 = 4                                   |  |
| <b>sc1_3_5</b>                                                                           | Does the household have a non-electric or electric clothes iron?<br>1 Yes<br>No<br>-99 Do not know/refuse to answer                                                                                                                 | *Select only one option                               |  |
| <b>sc1_3_6</b>                                                                           | Does the household have a clock (wall, wrist or pocket)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                       | *Select only one option                               |  |
| <b>sc1_3_7</b>                                                                           | Does the household have a radio, stereo system, or cassette player?<br>1 No<br>2 Radio only<br>3 Stereo system or cassette player (regardless of radio)<br>-99 Do not know/refuse to answer                                         | *Select only one option                               |  |
| <b>[Transition]</b> Enumerator: Now we will ask about your household's sources of income |                                                                                                                                                                                                                                     |                                                       |  |
| <b>sc1_5_1_0</b>                                                                         | Does your household currently obtain any income?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                               | *Select only one option                               |  |
|                                                                                          | Which of the following activities does your household obtain income from?                                                                                                                                                           | *Ask questions sc1_5_1_1 - sc1_6_2_5 if sc1_5_1_0 = 1 |  |
| <b>sc1_5_1_1</b>                                                                         | Dairy farming<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                  | *Select only one option                               |  |



|                              |                                                                                                           |                         |  |
|------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------|--|
| <b>sc1_5_1_2</b>             | Other livestock/beef fattening,<br>rearing livestock<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option |  |
| <b>sc1_5_1_3</b>             | Crop production<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                      | *Select only one option |  |
| <b>sc1_5_1_4</b>             | Fisheries<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                            | *Select only one option |  |
| <b>sc1_5_1_5</b>             | Government employment<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                | *Select only one option |  |
| <b>sc1_5_1_6</b>             | Private sector employment<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                            | *Select only one option |  |
| <b>sc1_5_1_7</b>             | Daily labor<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                          | *Select only one option |  |
| <b>sc1_5_1_8</b>             | Trader/shopkeeper<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                    | *Select only one option |  |
| <b>sc1_5_1_9</b>             | Social support<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                       | *Select only one option |  |
| <b>sc1_5_1_10</b>            | Forest products<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                      | *Select only one option |  |
| <b>sc1_5_1_11</b>            | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                | *Select only one option |  |
| <b>sc1_5_1_11<br/>_other</b> | Other, please specify                                                                                     | *Ask if sc1_5_1_11 = 1  |  |

**[Enumerator Instruction] : Now, from the income sources selected, please rank the top 5 on order of importance in income earned**

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--|
| sc1_5_2_1 | <p>Which was the most important income source? (1)</p> <ol style="list-style-type: none"> <li>1 Dairy farming</li> <li>2 Other livestock/beef fattening, rearing livestock</li> <li>3 Crop production</li> <li>4 Fisheries</li> <li>5 Government employment</li> <li>6 Private sector employment</li> <li>7 Daily labor</li> <li>8 Trader/shopkeeper</li> <li>9 Social support</li> <li>10 Forest products</li> <li>98 Other</li> </ol>                        | *Select only one option |  |
| sc1_5_2_2 | <p>Which was the second most important income source? (2)</p> <ol style="list-style-type: none"> <li>1 Dairy farming</li> <li>2 Other livestock/beef fattening, rearing livestock</li> <li>3 Crop production</li> <li>4 Fisheries</li> <li>5 Government employment</li> <li>6 Private sector employment</li> <li>7 Daily labor</li> <li>8 Trader/shopkeeper</li> <li>9 Social support</li> <li>10 Forest products</li> <li>11 N/A</li> <li>98 Other</li> </ol> | *Select only one option |  |
| sc1_5_2_3 | <p>Which was the third most important income source? (3)</p> <ol style="list-style-type: none"> <li>1 Dairy farming</li> <li>2 Other livestock/beef fattening, rearing livestock</li> <li>3 Crop production</li> <li>4 Fisheries</li> <li>5 Government employment</li> <li>6 Private sector employment</li> <li>7 Daily labor</li> <li>8 Trader/shopkeeper</li> <li>9 Social support</li> <li>10 Forest products</li> </ol>                                    | *Select only one option |  |

|                  |                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                  |  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--|
|                  | 11 N/A<br>98 Other                                                                                                                                                                                                                                                                                                                     |                                                                                                                                  |  |
| <b>sc1_5_2_4</b> | Which was the fourth most important income source? (4)<br>1 Dairy farming<br>2 Other livestock/beef fattening, rearing livestock<br>3 Crop production<br>4 Fisheries<br>5 Government employment<br>6 Private sector employment<br>7 Daily labor<br>8 Trader/shopkeeper<br>9 Social support<br>10 Forest products<br>11 N/A<br>98 Other | *Select only one option                                                                                                          |  |
| <b>sc1_6_2_5</b> | Which was the fifth most important income source? (5)<br>1 Dairy farming<br>2 Other livestock/beef fattening, rearing livestock<br>3 Crop production<br>4 Fisheries<br>5 Government employment<br>6 Private sector employment<br>7 Daily labor<br>8 Trader/shopkeeper<br>9 Social support<br>10 Forest products<br>11 N/A<br>98 Other  | *Select only one option                                                                                                          |  |
| <b>sc1_6_3</b>   | Were there any months in the past twelve months (July 1, 2018 – June 30, 2019), that your family did not have enough to eat?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                      | *Select only one option                                                                                                          |  |
| <b>sc1_6_5</b>   | In which months in the past twelve months (July 1, 2018 – June 30, 2019) did your household NOT have enough to eat?<br>1 July, 2018<br>2 August, 2018                                                                                                                                                                                  | *Ask if sc1_6_3 = 1<br>*Select only one option<br>*If exhausted reserves more than once, select the last time exhausted reserves |  |

|                |                                                                                                                                                                                                                             |                                                                                                                      |  |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--|
|                | 3 September, 2018<br>4 October, 2018<br>5 November, 2018<br>6 December, 2018<br>7 January, 2019<br>8 February, 2019<br>9 March, 2019<br>10 April, 2019<br>11 May, 2019<br>12 June, 2019<br>-99 Do not know/refuse to answer |                                                                                                                      |  |
| <b>sc1_6_6</b> | Currently, how many meals do you eat per day?                                                                                                                                                                               | *Enter -99 if Do not know/refuse to answer<br>*Explain: Meal is defined as portion of food to satisfy one's appetite |  |

## SECTION 2: CURRENT DAIRY PRODUCTION

**[Transition]:** Enumerator: Great! Now I would like to ask you about your cattle and current dairy production.

| VARIABLES | CURRENT DAIRY PRODUCTION                                                                                                                                                                                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                             | PMP INDICATOR                                      |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------|
| sc2_1     | Do you or anyone in your household currently own, or have you ever owned, any dairy cows?<br>1 Yes, currently<br>2 Currently no, but previously did → <b>Thank respondent and conclude interview.</b><br>3 Never owned → <b>Thank respondent and conclude interview.</b><br>-99 Do not know/refuse to answer → <b>Thank respondent and conclude interview</b> | *Select only one option                                             | INDICATORS:<br>#1; #2; #7 - #13;<br>#15 - #18; #24 |
| sc2_2     | In what year did you begin dairy farming?                                                                                                                                                                                                                                                                                                                     | *Enter -99 if Do not know/refuse to answer                          |                                                    |
| sc2_3     | What was the maximum number of dairy cattle that you have ever owned?                                                                                                                                                                                                                                                                                         | *Enter -99 if Do not know/refuse to answer<br>*Enter number>0       |                                                    |
| s2_6_1_1  | How many pure dairy breed bulls does your household currently have / raise?                                                                                                                                                                                                                                                                                   | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |                                                    |
| s2_6_2_1  | How many crossbreed bulls does your household currently have / raise?                                                                                                                                                                                                                                                                                         | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |                                                    |
| s2_6_3_1  | How many total bulls does your household currently have / raise?                                                                                                                                                                                                                                                                                              | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |                                                    |
| s2_6_1_2  | How many pure dairy breed cows does your household currently have / raise?                                                                                                                                                                                                                                                                                    | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |                                                    |
| s2_6_2_2  | How many crossbreed cows does your household currently have / raise?                                                                                                                                                                                                                                                                                          | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |                                                    |
| s2_6_3_2  | How many total cows does your household currently have / raise?                                                                                                                                                                                                                                                                                               | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned | INDICATORS:<br>#1; #2; #7-#13;<br>#15-#18; #24     |
| s2_6_1_4  | How many pure dairy breed heifers does your household currently have / raise?                                                                                                                                                                                                                                                                                 | *Enter -99 if Do not know/refuse to answer                          |                                                    |

|                                                                                                                                                  |                                                                                                                                                                                                      |                                                                     |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--|
|                                                                                                                                                  |                                                                                                                                                                                                      | *Enter 0 if not owned                                               |  |
| <b>s2_6_2_4</b>                                                                                                                                  | How many crossbreed heifers does your household currently have / raise?                                                                                                                              | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |  |
| <b>s2_6_3_4</b>                                                                                                                                  | How many total heifers does your household currently have / raise?                                                                                                                                   | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |  |
| <b>s2_6_1_7</b>                                                                                                                                  | How many pure dairy breed female calves does your household currently have / raise?                                                                                                                  | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |  |
| <b>s2_6_2_7</b>                                                                                                                                  | How many crossbreed female calves does your household currently have / raise?                                                                                                                        | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |  |
| <b>s2_6_3_7</b>                                                                                                                                  | How many total female calves does your household currently have / raise?                                                                                                                             | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |  |
| <b>s2_6_1_8</b>                                                                                                                                  | How many pure dairy breed male calves does your household currently have / raise?                                                                                                                    | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |  |
| <b>s2_6_2_8</b>                                                                                                                                  | How many crossbreed male calves does your household currently have / raise?                                                                                                                          | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |  |
| <b>s2_6_3_8</b>                                                                                                                                  | How many total male calves does your household currently have / raise?                                                                                                                               | *Enter -99 if Do not know/refuse to answer<br>*Enter 0 if not owned |  |
|                                                                                                                                                  | <p>Now please tell me about the cows in your herd – if you have more than 4 cows in your herd, please tell me about only 4 cows of your choice</p> <p>For each cow please answer the following :</p> | *Ask if s2_6_3_2<=10 else skip to sc2_10_RECORD                     |  |
| <b>NOME_DA_V</b><br><b>ACA\$1</b><br><b>NOME_DA_V</b><br><b>ACA\$2</b><br><b>NOME_DA_V</b><br><b>ACA\$3</b><br><b>NOME_DA_V</b><br><b>ACA\$4</b> | Name                                                                                                                                                                                                 | *Enter -99 if cow does not have a name                              |  |
| <b>SC2_7_0_REC</b><br><b>ORD\$1</b><br><b>SC2_7_0_REC</b><br><b>ORD\$2</b>                                                                       | Do you have a recordbook for this cow?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                          | *Select only one option                                             |  |

|                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                    |                                                                                                                                               |               |
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| SC2_7_0_REC<br>ORD\$3<br>SC2_7_0_REC<br>ORD\$4                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                    |                                                                                                                                               |               |
| SC2_7_1\$1<br>SC2_7_1\$2<br>SC2_7_1\$3<br>SC2_7_1\$4                                                                                                                                                                                                                                                                                                                          | Is this cow purebred dairy or crossbred?<br>1 Purebred dairy<br>2 Crossbred<br>-99 Do not know/refuse to answer                                                                                                                                                                                    | *Select only one option                                                                                                                       |               |
| SC2_7_2_REC<br>ORD\$1<br>SC2_7_2_REC<br>ORD\$2<br>SC2_7_2_REC<br>ORD\$3<br>SC2_7_2_REC<br>ORD\$4                                                                                                                                                                                                                                                                              | Does the record book have information on the first time the cow gave birth (while she was under your responsibility)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                         | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR<br>SC2_7_0_RECORD\$3 = 1 OR<br>SC2_7_0_RECORD\$4 = 1<br><br>*Select only one option |               |
| <b>[Enumerator Instruction]:</b> If sc2_7_2_RECORD\$1 – sc2_7_2_RECORD\$4 = 1, then for questions sc2_7_2_MONTH\$1 – sc2_7_2_MONTH\$4 and sc2_7_2_MES\$1 – sc2_7_2_MES\$4, fill out from the record book; else ask only the date and fill out yourself.<br><br><b>For example, if they say « January 1, 2019 », then fill « 1 » for the month ; and « 2019 » for the year</b> |                                                                                                                                                                                                                                                                                                    |                                                                                                                                               |               |
| sc2_7_2_MO<br>NTH\$1<br>sc2_7_2_MO<br>NTH\$2<br>sc2_7_2_MO<br>NTH\$3<br>sc2_7_2_MO<br>NTH\$4                                                                                                                                                                                                                                                                                  | When was the first time she gave birth (while she was under your responsibility)? Please give me the date<br>1 January<br>2 February<br>3 March<br>4 April<br>5 May<br>6 June<br>7 July<br>8 August<br>9 September<br>10 October<br>11 November<br>12 December<br>-99 Do not know/refuse to answer | *Select only one option<br>*Ask only the date and fill this out yourself                                                                      | INDICATOR: #9 |
| sc2_7_2_MES<br>\$1<br>sc2_7_2_MES<br>\$2<br>sc2_7_2_MES<br>\$3                                                                                                                                                                                                                                                                                                                | Year                                                                                                                                                                                                                                                                                               | *Ask only the date and fill this out yourself<br>*Enter -99 if Do not know/refuse to answer                                                   | INDICATOR: #9 |



|                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                          |                                                                                                                                                                                                                                                     |               |
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| sc2_7_2_MES\$4                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                          |                                                                                                                                                                                                                                                     |               |
| sc2_7_3_REC ORD\$1<br>sc2_7_3_REC ORD\$2<br>sc2_7_3_REC ORD\$3<br>sc2_7_3_REC ORD\$4                                                                                                                                                                                                                                                                                                                                                       | Does the record book have information on how many times the cow has been pregnant ?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1<br>*Select only one option                                                                                                                 |               |
| sc2_7_3\$1<br>sc2_7_3\$2<br>sc2_7_3\$3<br>sc2_7_3\$4                                                                                                                                                                                                                                                                                                                                                                                       | How many times has she been pregnant (while under your responsibility)?                                                                  | *If SC2_7_3_RECORD\$1 = 1 OR SC2_7_3_RECORD\$2 = 1 OR SC2_7_3_RECORD\$3 = 1 OR SC2_7_3_RECORD\$4 = 1 then fill from record book ; else ask the répondent and fill yourself<br>*Select only one option<br>*Enter -99 if Do not know/refuse to answer | INDICATOR: #9 |
| sc2_7_4_REC ORD\$1<br>sc2_7_4_REC ORD\$2<br>sc2_7_4_REC ORD\$3<br>sc2_7_4_REC ORD\$4                                                                                                                                                                                                                                                                                                                                                       | Does the record book have information on when the cow last calved?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                  | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1<br>*Select only one option                                                                                                                 |               |
| <p><b>[Enumerator Instruction] : If sc2_7_4_RECORD\$1 – sc2_7_4_RECORD\$4 = 1, then for questions sc2_7_4_DAY\$1 – sc2_7_4_DAY\$4, sc2_7_4_MONTH\$1 – sc2_7_4_MONTH\$4 and sc2_7_4_YEAR\$1 – sc2_7_4_YEAR\$4, fill out from record book; else ask only the date and fill out yourself.</b></p> <p><b>For example, if the respondent says « January 1, 2019 » then fill out « 1 » for day, « 1 » for January, and « 2019 » for year</b></p> |                                                                                                                                          |                                                                                                                                                                                                                                                     |               |
| sc2_7_4_DAY \$1<br>sc2_7_4_DAY \$2<br>sc2_7_4_DAY \$3<br>sc2_7_4_DAY \$4                                                                                                                                                                                                                                                                                                                                                                   | When did she last calve?<br>Day                                                                                                          | *Enter -99 if Do not know/refuse to answer<br>*Enter number between 1 – 31                                                                                                                                                                          | INDICATOR: #8 |

|                                                                                                                                      |                                                                                                                                                                                                |                                                                                                                                                                                                                    |               |
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| <b>sc2_7_4_MO<br/>NTH\$1</b><br><b>sc2_7_4_MO<br/>NTH\$2</b><br><b>sc2_7_4_MO<br/>NTH\$13</b><br><b>sc2_7_4_MO<br/>NTH\$4</b>        | Month<br>1 January<br>2 February<br>3 March<br>4 April<br>5 May<br>6 June<br>7 July<br>8 August<br>9 September<br>10 October<br>11 November<br>12 December<br>-99 Do not know/refuse to answer | *Select only one option                                                                                                                                                                                            | INDICATOR: #8 |
| <b>sc2_7_4_YEA<br/>R\$1</b><br><b>sc2_7_4_YEA<br/>R\$2</b><br><b>sc2_7_4_YEA<br/>R\$3</b><br><b>sc2_7_4_YEA<br/>R\$4</b>             | Year                                                                                                                                                                                           | *Enter -99 if Do not know/refuse to answer                                                                                                                                                                         | INDICATOR: #8 |
| <b>sc2_58\$1</b><br><b>sc2_58\$2</b><br><b>sc2_58\$3</b><br><b>sc2_58\$4</b>                                                         | Is she currently producing milk?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                          | *Select only one option                                                                                                                                                                                            | INDICATOR: #8 |
| <b>sc2_58_1_REC<br/>ORD\$1</b><br><b>sc2_58_1_REC<br/>ORD\$2</b><br><b>sc2_58_1_REC<br/>ORD\$3</b><br><b>sc2_58_1_REC<br/>ORD\$4</b> | Does the record book have information on how much milk she produced yesterday ? (morning and evening combined)<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                            | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR<br>SC2_7_0_RECORD\$3 = 1 OR<br>SC2_7_0_RECORD\$4 = 1<br>*Select only one option                                                                          |               |
| <b>sc2_58_1\$1</b><br><b>sc2_58_1\$2</b><br><b>sc2_58_1\$3</b><br><b>sc2_58_1\$4</b>                                                 | How much milk did she produce yesterday (morning and evening combined)?                                                                                                                        | *Enter in liters<br>*Enter -99 if Do not know/refuse to answer<br>*If sc2_58_1_RECORD\$1 = 1 OR<br>sc2_58_1_RECORD\$2 = 1 OR<br>sc2_58_1_RECORD\$3 = 1 OR<br>sc2_58_1_RECORD\$4 = 1<br>then fill from record book, |               |

|                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                              |                                                                                                                                                                                                                                         |               |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                              | else ask respondent and fill out                                                                                                                                                                                                        |               |
| sc2_58_2_RECORD\$1<br>sc2_58_2_RECORD\$2<br>sc2_58_2_RECORD\$3<br>sc2_58_2_RECORD\$4                                                                                                                                                                                                                                                                                                                                           | Does the record book have information on how much milk she produced at her peak production (morning and evening) during this lactation?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1<br>*Select only one option                                                                                                     |               |
| sc2_58_2\$1<br>sc2_58_2\$2<br>sc2_58_2\$3<br>sc2_58_2\$4                                                                                                                                                                                                                                                                                                                                                                       | How much milk did she produce at her peak production (morning and evening) during this lactation?                                                                                            | *Enter in liters<br>*Enter -99 if Do not know/refuse to answer<br>*If sc2_58_2_RECORD\$1 = 1 OR sc2_58_2_RECORD\$2 = 1 OR sc2_58_2_RECORD\$3 = 1 OR sc2_58_2_RECORD\$4 = 1 then fill from record book, else ask respondent and fill out |               |
| sc2_5_8_RECORD\$1<br>sc2_5_8_RECORD\$2<br>sc2_5_8_RECORD\$3<br>sc2_5_8_RECORD\$4                                                                                                                                                                                                                                                                                                                                               | Does the record book have information on when she stopped producing milk?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                               | *Ask if sc2_58\$1=2 OR -99 ; sc2_58\$2=2 OR -99 ; sc2_58\$3=2 OR -99 ; sc2_58\$4=2 OR -99 ;<br>*Select only one option                                                                                                                  |               |
| <p><b>[Enumerator Instruction]:</b> If sc2_5_8_RECORD\$1 – sc2_5_8_RECORD\$4 = 1, then for questions sc2_5_8_DAY\$1 – sc2_5_8_DAY\$4 ; sc2_5_8_MONTH\$1 – sc2_5_8_MONTH\$4 ; and sc2_5_8_YEAR\$1 – sc2_5_8_YEAR\$4, fill out from record book ; else ask only the date and fill out yourself.</p> <p><b>For example, if they say « January 1, 2019 », fill out « 1 » for day ; « 1 » for month ; and « 2019 » for year</b></p> |                                                                                                                                                                                              |                                                                                                                                                                                                                                         |               |
| sc2_5_8_DAY\$1<br>sc2_5_8_DAY\$2<br>sc2_5_8_DAY\$3<br>sc2_5_8_DAY\$4                                                                                                                                                                                                                                                                                                                                                           | When did she stop producing milk?<br>Day                                                                                                                                                     | *Ask if<br>sc2_58\$1 = 2 OR<br>sc2_58\$2 = 2 OR<br>sc2_58\$3 = 2 OR<br>sc2_58\$4 = 2<br>*Enter number between 1 – 31<br>*Enter -99 if Do not know/refuse to answer                                                                      | INDICATOR: #8 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                |                                                                                                                                        |               |
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| sc2_5_8_MO<br>NTH\$1<br>sc2_5_8_MO<br>NTH\$2<br>sc2_5_8_MO<br>NTH\$3<br>sc2_5_8_MO<br>NTH\$4                                                                                                                                                                                                                                                                                                                                                     | Month<br>1 January<br>2 February<br>3 March<br>4 April<br>5 May<br>6 June<br>7 July<br>8 August<br>9 September<br>10 October<br>11 November<br>12 December<br>-99 Do not know/refuse to answer | *Ask if<br>sc2_58\$1 = 2 OR<br>sc2_58\$2 = 2 OR<br>sc2_58\$3 = 2 OR<br>sc2_58\$4 = 2<br><br>*Select only one option                    | INDICATOR: #8 |
| sc2_5_8_YEA<br>R\$1<br>sc2_5_8_YEA<br>R\$2<br>sc2_5_8_YEA<br>R\$3<br>sc2_5_8_YEA<br>R\$4                                                                                                                                                                                                                                                                                                                                                         | Year                                                                                                                                                                                           | *Ask if<br>sc2_58\$1 = 2 OR<br>sc2_58\$2 = 2 OR<br>sc2_58\$3 = 2 OR<br>sc2_58\$4 = 2<br><br>*Enter -99 if Do not know/refuse to answer | INDICATOR: #8 |
| sc2_5_9_REC<br>ORD\$1<br>sc2_5_9_REC<br>ORD\$2<br>sc2_5_9_REC<br>ORD\$3<br>sc2_5_9_REC<br>ORD\$4                                                                                                                                                                                                                                                                                                                                                 | Does the record book have information on the second to last time she gave birth?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                          | *Select only one option                                                                                                                |               |
| <p><b>[Enumerator Instruction]:</b> If sc2_5_9_RECORD\$1 – sc2_5_9_RECORD\$4 = 1, then for questions sc2_5_9_DAY\$1 – sc2_5_9_DAY\$4 ; sc2_5_9_MONTH\$1 – sc2_5_9_MONTH\$4 ; and sc2_5_9_YEAR\$1 – sc2_5_9_YEAR\$4, fill out from the record book ; else ask only the date and fill out yourself.</p> <p><i>For example, if they say « January 1, 2019 », then enter « 1 » for the day ; « 1 » for the month ; and « 2019 » for the year</i></p> |                                                                                                                                                                                                |                                                                                                                                        |               |
| sc2_5_9_DAY<br>\$1<br>sc2_5_9_DAY<br>\$2<br>sc2_5_9_DAY<br>\$3                                                                                                                                                                                                                                                                                                                                                                                   | When did she give birth the second to last time?<br>Day                                                                                                                                        | *Enter -99 if Do not know/refuse to answer<br>*Enter number between 1 – 31                                                             | INDICATOR: #8 |

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| sc2_5_9_DAY\$4                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                |                                             |               |
| sc2_5_9_MONTH\$1<br>sc2_5_9_MONTH\$2<br>sc2_5_9_MONTH\$3<br>sc2_5_9_MONTH\$4                                                                                                                                                                                                                                                                                                                                                                             | Month<br>1 January<br>2 February<br>3 March<br>4 April<br>5 May<br>6 June<br>7 July<br>8 August<br>9 September<br>10 October<br>11 November<br>12 December<br>-99 Do not know/refuse to answer | *Select only one option                     | INDICATOR: #8 |
| sc2_5_9_YEAR\$1<br>sc2_5_9_YEAR\$2<br>sc2_5_9_YEAR\$3<br>sc2_5_9_YEAR\$4                                                                                                                                                                                                                                                                                                                                                                                 | Year                                                                                                                                                                                           | *Enter --99 if Do not know/refuse to answer | INDICATOR: #8 |
| sc2_5_10_RECORD\$1<br>sc2_5_10_RECORD\$2<br>sc2_5_10_RECORD\$3<br>sc2_5_10_RECORD\$4                                                                                                                                                                                                                                                                                                                                                                     | Does the record book have information on when she stopped producing milk the second to last time ?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                        | *Select only one option                     |               |
| <p><b>[Enumerator Instruction]:</b> If sc2_5_10_RECORD\$1 – sc2_5_10_RECORD\$4 = 1, then for questions sc2_5_10_DAY\$1 – sc2_5_10_DAY\$4 ; sc2_5_10_MONTH\$1 – sc2_5_10_MONTH\$4 ; and sc2_5_10_YEAR\$1 – sc2_5_10_YEAR\$4, fill out from the record book ; else ask only the date and fill out yourself.</p> <p><b>For example, if they say « January 1, 2019 », then enter « 1 » for the day ; « 1 » for the month ; and « 2019 » for the year</b></p> |                                                                                                                                                                                                |                                             |               |
| sc2_5_10_DAY\$1<br>sc2_5_10_DAY\$2<br>sc2_5_10_DAY\$4                                                                                                                                                                                                                                                                                                                                                                                                    | When did the cow stop producing milk the second to last time?<br>Day                                                                                                                           | *Enter number between 1 - 31                | INDICATOR: #8 |

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| Y\$3<br>sc2_5_10_DA<br>Y\$4                                                                      |                                                                                                                                                                                                |                                                                                                                                 |               |
| sc2_5_10_MO<br>NTH\$1<br>sc2_5_10_MO<br>NTH\$2<br>sc2_5_10_MO<br>NTH\$3<br>sc2_5_10_MO<br>NTH\$4 | Month<br>1 January<br>2 February<br>3 March<br>4 April<br>5 May<br>6 June<br>7 July<br>8 August<br>9 September<br>10 October<br>11 November<br>12 December<br>-99 Do not know/refuse to answer | *Select only one option                                                                                                         | INDICATOR: #8 |
| sc2_5_10_YEA<br>R\$1<br>sc2_5_10_YEA<br>R\$2<br>sc2_5_10_YEA<br>R\$3<br>sc2_5_10_YEA<br>R\$4     | Year                                                                                                                                                                                           | *Enter -99 if Do not know/refuse to answer                                                                                      | INDICATOR: #8 |
| <b>[Enumerator Instruction]: For producers with 10 or more cows ask the following questions</b>  |                                                                                                                                                                                                |                                                                                                                                 |               |
| Sc2_10_RECO<br>RD                                                                                | Do you have a recordbook for your cows ?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                  | *Ask if s2_6_3_2>10<br><br>*Select only one option                                                                              |               |
| Sc2_10_1_RE<br>CORD                                                                              | Does the record book have information on the typical lactation period in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer               | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br><br>*Select only one option                                                          |               |
| sc2_10                                                                                           | On average, what was the typical lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                          | *Ask if s2_6_3_2>10<br>*If sc2_10_RECORD_1 = 1 then enter from record book ; else aks respondent and fill out<br>*Enter in days |               |

|                        |                                                                                                                                                                                                                                             |                                                                                                                         |  |
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|                        |                                                                                                                                                                                                                                             | *Enter 0 if no cow produces milk<br>*Enter -99 if Do not know/refuse to answer                                          |  |
| <b>Sc2_10_2_RECORD</b> | Does the record book have information on the minimum lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                              | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br>*Select only one option                                                      |  |
| <b>Sc2_10_1</b>        | What is the minimum lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                    | *Ask if s2_6_3_2>10<br>*Enter in days<br>*Enter 0 if no cow produces milk<br>*Enter -99 if Do not know/refuse to answer |  |
| <b>Sc2_10_3_RECORD</b> | Does the record book have information on the maximum lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                              | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br>*Select only one option                                                      |  |
| <b>Sc2_10_2</b>        | What is the maximum lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                    | *Ask if s2_6_3_2>10<br>*Enter in days<br>*Enter 0 if no cow produces milk<br>*Enter -99 if Do not know/refuse to answer |  |
| <b>Sc2_10_4_RECORD</b> | Does the record book have information on in the last 12 months (July 1, 2018 – June 30, 2019), how many days passed between calves for your cows? (i.e. what is the calving interval?)<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br>*Select only one option                                                      |  |
| <b>sc2_11</b>          | On average, in the last 12 months (July 1, 2018 – June 30, 2019), how many days pass between calves for your cows? (i.e. what is the calving interval?)                                                                                     | *Ask if s2_6_3_2>10<br>*Enter -99 if Do not know/refuse to answer                                                       |  |



|                        |                                                                                                                                                                                                                                                                               |                                                                    |  |
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| <b>Sc2_10_5_RECORD</b> | Does the record book have information on in the last 12 months (July 1, 2018 – June 30, 2019), what is the minimum number of days that passed between calves for your cows? (i.e. what is the minimum calving interval?)<br>3 Yes<br>4 No<br>-99 Do not know/refuse to answer | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br>*Select only one option |  |
| <b>sc2_11_1</b>        | In the last 12 months (July 1, 2018 – June 30, 2019), what is the minimum number of days that passed between calves for your cows? (i.e. what is the minimum calving interval?)                                                                                               | *Ask if s2_6_3_2>10<br>*Enter -99 if Do not know/refuse to answer  |  |
| <b>Sc2_10_6_RECORD</b> | Does the record book have information on in the last 12 months (July 1, 2018 – June 30, 2019), what is the maximum number of days that passed between calves for your cows? (i.e. what is the maximum calving interval?)<br>5 Yes<br>6 No<br>-99 Do not know/refuse to answer | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br>*Select only one option |  |
| <b>sc2_11_2</b>        | In the last 12 months (July 1, 2018 – June 30, 2019), what is the maximum number of days that passed between calves for your cows? (i.e. what is the maximum calving interval?)                                                                                               | *Ask if s2_6_3_2>10<br>*Enter -99 if Do not know/refuse to answer  |  |

## SECTION 3 : PRODUCTION PRACTICES

**[Transition]:** Enumerator: Thank you! Now we want to talk about your dairy production practices.

| VARIABLES | PRODUCTION PRACTICES                                                                                                                                                                                                                    | ENUMERATOR INSTRUCTIONS                                                    | PMP INDICATOR     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------|
| sc3_1_1   | Do you graze your dairy cattle?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                    | *Select only one option<br>*If sc3_1_1 = 2 OR sc3_1_1 = -99, go to sc3_1_7 |                   |
| sc3_1_2   | What grazing system do you follow for your dairy cattle?<br>1 Free grazing<br>2 Partial grazing<br>3 Paddock grazing<br>-99 Do not know/refuse to answer                                                                                | *Select all that apply<br>*Ask if sc3_1_1 = 1                              |                   |
| sc3_1_4   | How long does it take you to get your cattle to pasture? (in minutes)                                                                                                                                                                   | *Enter -99 if Do not know/refuse to answer                                 |                   |
| sc3_1_5   | How easy or difficult is it for you to access adequate grazing for your dairy cattle?<br>1 Very easy<br>2 Somewhat easy<br>3 Neither easy nor difficult<br>4 Somewhat difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer | *Select only one option                                                    | INDICATOR:<br>#13 |
| sc3_1_6   | Do you pay for access to grazing?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                  | *Select only one option                                                    |                   |
| sc3_1_7   | Did you provide supplements to your dairy cattle over the last 12 months? That is, in addition to grazing, other types of food such as ration, salt, melasos, etc. are given.<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer      | *Select only one option<br>*If sc3_1_7 = 2 OR sc3_1_ = -99, go to sc3_3_1  | INDICATOR:<br>#10 |
|           | What type of supplement did you use?                                                                                                                                                                                                    | *Read out choices one at a time<br>*Ask if sc3_1_7 = 1                     |                   |
| sc3_2_2_1 | Salt                                                                                                                                                                                                                                    | *Select only one option                                                    |                   |

|                   |                                                                                                                                 |                                                |                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------|
|                   | 1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                               |                                                |                   |
| <b>sc3_2_2_2</b>  | Molasses<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                   | *Select only one option                        |                   |
| <b>sc3_2_2_3</b>  | Maize bran<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                 | *Select only one option                        |                   |
| <b>sc3_2_2_4</b>  | Wheat bran<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                 | *Select only one option                        |                   |
| <b>sc3_2_2_5</b>  | Beer residue<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                               | *Select only one option                        |                   |
| <b>sc3_2_2_6</b>  | Ration/Industrial feed<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                     | *Select only one option                        |                   |
| <b>sc3_2_2_7</b>  | Mineral blocks<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                             | *Select only one option                        |                   |
| <b>sc3_2_2_8</b>  | Crop residues stored<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                       | *Select only one option                        |                   |
| <b>sc3_2_2_9</b>  | Crop residues fresh<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                        | *Select only one option                        |                   |
| <b>sc3_2_2_10</b> | Crop residues silage<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                       | *Select only one option                        |                   |
| <b>sc3_2_3</b>    | How easy or difficult is it for you to access adequate supplementation for your dairy cattle?<br>1 Very easy<br>2 Somewhat easy | *Ask if sc3_1_7 = 1<br>*Select only one option | INDICATOR:<br>#13 |

|                  |                                                                                                                                                        |                                                                                        |                      |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------|
|                  | 3 Neither easy nor difficult<br>4 Somewhat difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer                                           |                                                                                        |                      |
| <b>sc3_2_4_A</b> | Where do you get the supplements?<br>1 Input supplier<br>2 Veterinary store<br>3 Other farmers<br>4 Other, specify<br>-99 Do not know/refuse to answer | *Select all that apply<br>*Ask if sc3_1_7 = 1                                          |                      |
| <b>sc3_2_4</b>   | How much was your spending on supplements in the last 12 months (July 1, 2018 – June 30, 2019)?                                                        | *Ask if sc3_1_7 = 1<br>*Enter in Metical<br>*Enter -99 if do not know/refuse to answer | INDICATOR:<br>#1; #8 |
| <b>sc3_3_1</b>   | Do you use fodder to feed your cattle herd?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                       | *Select only one option                                                                | INDICATOR:<br>#10    |
|                  | What form of fodder do you use?                                                                                                                        | *Ask each below separately<br>*Ask if sc3_3_1 = 1                                      |                      |
| <b>sc3_3_2_1</b> | Fresh<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                             | *Select only one option                                                                |                      |
| <b>sc3_3_2_2</b> | Hay<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                               | *Select only one option                                                                |                      |
| <b>sc3_3_2_3</b> | Silage<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                            | *Select only one option                                                                |                      |
|                  | Where did you get fodder during the last 12 months (July 2018 – July 2019)?                                                                            | *Ask each below separately<br>*Ask if sc3_3_2_2 = 1 OR<br>sc3_3_2_3 = 1                |                      |
| <b>sc3_3_4_1</b> | Own production<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                    | *Select only one option                                                                |                      |
| <b>sc3_3_4_2</b> | Pasture zone (they went to search in the bush)                                                                                                         | *Select only one option                                                                |                      |

|                  |                                                                                                                                                                                                                                        |                                                                                       |                   |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------|
|                  | 1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                      |                                                                                       |                   |
| <b>sc3_3_4_3</b> | Purchased<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                         | *Select only one option                                                               |                   |
| <b>sc3_3_5</b>   | Who was your supplier?<br>1 Input supplier<br>2 Other farmers<br>3 Veterinary store/other stores<br>4 Other, specify<br>-99 Do not know/refuse to answer                                                                               | *Select all that apply<br>*Ask if sc3_3_4_3 = 1                                       |                   |
| <b>sc3_3_7</b>   | What is the total area where you planted fodder in the last 12 months (July 1, 2018 – June 30, 2019) (in hectares)?                                                                                                                    | *Ask if sc3_3_4_1 = 1<br>*Enter -99 if do not know/refuse to answer                   | INDICATOR:<br>#11 |
| <b>sc3_3_8</b>   | How easy or difficult is it access to adequate fodder for your dairy cattle? (scale)<br>1 Very easy<br>2 In a way easy<br>3 Neither easy nor difficult<br>4 In a way difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer | *Ask if sc3_3_1 = 1<br>*Select only one option                                        | INDICATOR:<br>#13 |
| <b>sc3_4_1</b>   | How do your dairy cattle access drinking water when it is in the Kraal?<br>1 Has continuous access to water<br>2 Bring water to livestock<br>-99 Do not know/refuse to answer                                                          | *Select only one option                                                               | INDICATOR:<br>#10 |
| <b>sc3_4_2</b>   | How much water (L) on average did you bring to each animal per day in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                               | *Ask if sc3_4_1 = 2<br>*Enter -99 if do not know/refuse to answer<br>*Enter in liters |                   |
| <b>sc3_4_3</b>   | How does your dairy have access to water while grazing?<br>1 Has continuous access to water sources<br>2 I take the cattle to the water<br>3 I bring water to cattle<br>-99 Do not know/refuse to answer                               | *Select only one option                                                               |                   |
| <b>sc3_4_4</b>   | How much water (L) on average do you bring to each animal per day in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                | *Ask if sc3_4_3 = 3<br>*Enter -99 if do not know/refuse to answer<br>*Enter in liters |                   |

|                        |                                                                                                                                                                                                                                                           |                                                                    |                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------|
| <b>sc3_4_6</b>         | Do you pay for access to water for your dairy cattle?<br>1 Yes<br>2 No<br>-99 Do not knw/refuse to asnwer                                                                                                                                                 | *Select only one option                                            |                                     |
| <b>sc3_5_1</b>         | Where are your cattle kept?<br>1 Kraal<br>2 Veranda<br>3 Under the tree<br>-99 Do not know/refuse to answer                                                                                                                                               | *Select all that apply                                             |                                     |
| <b>sc3_5_1_1</b>       | Which of the following do you have in your kraal ?<br>1 Feeder/food receptacle<br>2 Water cooler/water receptacl<br>3 Sheet cover to give shade<br>4 Cement in the milking area<br>5 A dry ground<br>6 Other, specify<br>-99 Do not know/refuse to answer | *Ask if sc3_5_1 = 1<br>*Read all options<br>*Select all that apply | INDICATOR:<br>#26                   |
| <b>sc3_6_1</b>         | Do you milk by machine or by hand?<br>1 Machine<br>2 By hand<br>-99 Do not know/refuse to answer                                                                                                                                                          | *Select all that apply                                             | INDICATORS<br>:<br>#10; #25,<br>#26 |
| <b>sc3_6_3_1</b>       | Where did you acquire your milking machine?<br>1 Land O'Lakes (MERCADO?)<br>2 Stores of agricultural and veterinary inputs<br>3 Local market<br>4 Cooperative<br>5 Other<br>-99 Do not know/refuse to answer                                              | *Ask if sc3_6_1 = 1<br>*Select all that apply                      |                                     |
| <b>sc3_6_3_5_OTHER</b> | Other (specify)                                                                                                                                                                                                                                           | *Ask if sc3_6_3_1 = 5                                              |                                     |
|                        | If you needed a new milking machine, where could you get one?                                                                                                                                                                                             | *Ask each option separately                                        |                                     |
| <b>sc3_6_4_1</b>       | Land O'Lakes /MERCADO<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                | *Select only one option                                            |                                     |
| <b>sc3_6_4_2</b>       | Stores of agricultural and veterinary inputs<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                         | *Select only one option                                            |                                     |

|                        |                                                                                                                                                                                                                        |                                                    |                   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------|
| <b>sc3_6_4_3</b>       | Local market<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                      | *Select only one option                            |                   |
| <b>sc3_6_4_4</b>       | Cooperative<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                       | *Select only one option                            |                   |
| <b>sc3_6_4_5</b>       | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                             | *Select only one option                            |                   |
| <b>sc3_6_4_5_OTHER</b> | Other, please specify                                                                                                                                                                                                  | *Ask if sc3_6_4_5 = 1                              |                   |
| <b>sc3_6_5</b>         | How easy or difficult is it to access a new milking machine? (scale)<br>1 Very easy<br>2 In a way easy<br>3 Neither easy nor difficult<br>4 In a way difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer | *Select only one option                            |                   |
| <b>sc3_7_1</b>         | Do you inspect for mastitis before milking?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                       | *Select only one option                            | INDICATOR:<br>#25 |
|                        | What means do you use to test for mastitis?                                                                                                                                                                            | *Ask each option separately<br>*Ask if sc3_7_1 = 1 |                   |
| <b>visual</b>          | Visual inspection of the udder for inflammation<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                   | *Select only one option                            |                   |
| <b>cup</b>             | Visual inspection of milk using strip cup<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                         | *Select only one option                            | INDICATOR:<br>#10 |
| <b>cmt</b>             | CMT test<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                          | *Select only one option                            | INDICATOR:<br>#10 |
|                        | If you need to get a new strip cup or CMT kits where can you get them?                                                                                                                                                 | *Ask each option separately                        |                   |



|                        |                                                                                                                                                                                                                           |                                            |                                     |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------|
| <b>sc3_7_4_1</b>       | Land O'Lakes /MERCADO<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                | *Select only one option                    |                                     |
| <b>sc3_7_4_2</b>       | Stores of agricultural and veterinary inputs<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                         | *Select only one option                    |                                     |
| <b>sc3_7_4_3</b>       | Local market<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                         | *Select only one option                    |                                     |
| <b>sc3_7_4_7</b>       | Imported<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                             | *Select only one option                    |                                     |
| <b>sc3_7_4_4</b>       | Cooperative<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                          | *Select only one option                    |                                     |
| <b>sc3_7_4_5</b>       | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                | *Select only one option                    |                                     |
| <b>sc3_7_4_5_OTHER</b> | Other, please specify                                                                                                                                                                                                     | *Ask if sc3_7_4_5 = 1                      |                                     |
| <b>sc3_7_9</b>         | How easy or difficult is it to access more CMT kits when you need them?<br>1 Very easy<br>2 In a way easy<br>3 Neither easy nor difficult<br>4 In a way difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer | *Ask if cmt = 1<br>*Select only one option | INDICATOR:<br>#13                   |
| <b>sc3_8</b>           | Do you use stainless steel buckets and/or stainless steel milk cans for milk?<br>1 No<br>2 Buckets only<br>3 Milk cans only<br>4 Both<br>-99 Do not know/refuse to answer                                                 | *Select only one option                    | INDICATORS<br>:<br>#10; #25,<br>#26 |
|                        | If you need a new stainless steel bucket and/or stainless steel milk can from where can you get it?                                                                                                                       | *Ask each option separately                |                                     |
| <b>sc3_8_1_1</b>       | Land O'Lakes / MERCADO                                                                                                                                                                                                    | *Select only one option                    |                                     |

|                        |                                                                                                                                                                                                                                                      |                         |                   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------|
|                        | 1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                    |                         |                   |
| <b>sc3_8_1_2</b>       | Stores of agricultural and veterinary inputs<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                    | *Select only one option |                   |
| <b>sc3_8_1_3</b>       | Local market<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                    | *Select only one option |                   |
| <b>sc3_8_1_7</b>       | Imported<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                        | *Select only one option |                   |
| <b>sc3_8_1_4</b>       | Cooperative<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                     | *Select only one option |                   |
| <b>sc3_8_1_5</b>       | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                           | *Select only one option |                   |
| <b>sc3_8_1_5_OTHER</b> | Other, please specify                                                                                                                                                                                                                                | *Ask if sc3_8_1_5 = 1   |                   |
| <b>sc3_8_1_6</b>       | Don't know<br>1 Yes<br>2 No                                                                                                                                                                                                                          | *Select only one option |                   |
| <b>sc3_8_5</b>         | How easy or difficult is it to get a new stainless steel bucket and/or a stainless steel milk can?<br>1 Very easy<br>2 In a way easy<br>3 Neither easy nor difficult<br>4 In a way difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer | *Select only one option | INDICATOR:<br>#13 |
| <b>sc3_8_01</b>        | Did you use chilling facilities for milk in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                  | *Select only one option | INDICATOR:<br>#14 |

|                         |                                                                                                                                     |                             |                             |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|
|                         | If you need new milk chilling equipment from where can you get it?                                                                  | *Ask each option separately |                             |
| <b>sc3_8_01_1</b>       | Land O'Lakes / MERCADO<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                         | *Select only one option     |                             |
| <b>sc3_8_01_2</b>       | Stores of agricultural and veterinary inputs<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                   | *Select only one option     |                             |
| <b>sc3_8_01_3</b>       | Local market<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                   | *Select only one option     |                             |
| <b>sc3_8_01_4</b>       | Imported<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                       | *Select only one option     |                             |
| <b>sc3_8_01_5</b>       | Cooperative<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                    | *Select only one option     |                             |
| <b>sc3_8_01_6</b>       | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                          | *Select only one option     |                             |
| <b>sc3_8_01_6_OTHER</b> | Other, please specify                                                                                                               | *Ask if sc3_8_01_6 = 1      |                             |
| <b>sc3_8_02</b>         | Did you use milk filters in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option     | INDICATORS<br>:<br>#14; #25 |
|                         | If you need a new milk filter from where can you get it?                                                                            | *Ask each option separately |                             |
| <b>sc3_8_02_1</b>       | Land O'Lakes / MERCADO<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                         | *Select only one option     |                             |
| <b>sc3_8_02_2</b>       | Stores of agricultural and veterinary inputs<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                   | *Select only one option     |                             |

|                  |                                                                                                                                     |                             |                   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------|
| sc3_8_02_3       | Local market<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                   | *Select only one option     |                   |
| sc3_8_02_4       | Imported<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                       | *Select only one option     |                   |
| sc3_8_02_5       | Cooperative<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                    | *Select only one option     |                   |
| sc3_8_02_6       | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                          | *Select only one option     |                   |
| sc3_8_02_6_OTHER | Other, please specify                                                                                                               | *Ask if sc3_8_02_6 = 1      |                   |
| sc3_8_03         | Did you use milk feeders in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option     | INDICATOR:<br>#14 |
|                  | If you need a new milk feeder from where can you get it?                                                                            | *Ask each option separately |                   |
| sc3_8_03_1       | Land O'Lakes / MERCADO<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                         | *Select only one option     |                   |
| sc3_8_03_2       | Stores of agricultural and veterinary inputs<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                   | *Select only one option     |                   |
| sc3_8_03_3       | Local market<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                   | *Select only one option     |                   |
| sc3_8_03_4       | Imported<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                       | *Select only one option     |                   |
| sc3_8_03_5       | Cooperative<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                    | *Select only one option     |                   |

|                                                                                                                  |                                                                                                                                                                         |                                                                                     |                   |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------|
| sc3_8_03_6                                                                                                       | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                              | *Select only one option                                                             |                   |
| sc3_8_03_6_OTHER                                                                                                 | Other, please specify                                                                                                                                                   | *Ask if sc3_8_03_6 = 1                                                              |                   |
| Sc8_01                                                                                                           | Does your household have a milk tank?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                              | *Select only one option                                                             |                   |
| sc8_02                                                                                                           | What is the capacity of the milk tank (or total capacity in the various tanks)?                                                                                         | *Ask if sc8_01 =1<br>*Enter in liters<br>*Enter -99 if Do not know/refuse to answer | INDICATOR:<br>#27 |
| <b>[Transition] Enumerator : Now I would like to ask you about your business planning</b>                        |                                                                                                                                                                         |                                                                                     |                   |
| Sc3_9_1                                                                                                          | Have you ever developed a business plan for your dairy activities?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                 | *Select only one option                                                             | INDICATOR:<br>#12 |
| Sc3_9_2                                                                                                          | Did you use a business plan for your dairy activities in the last 12 months (July 1, 2018 – June 30, 2019)?<br>3 Yes<br>4 No<br>-99 Do not know/refuse to answer        | *Ask if sc3_9_1 = 1<br>*Select only one option                                      | INDICATOR:<br>#12 |
| <b>[Transition]: Enumerator: Now I would like to ask you about any milk testing done by you prior to selling</b> |                                                                                                                                                                         |                                                                                     |                   |
| Sc3_10_1                                                                                                         | Do you do any quality testing on your milk before selling it?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                      | *Select only one option                                                             | INDICATOR:<br>#26 |
| Sc3_10_2                                                                                                         | What do you test for?<br>1 Water adulteration<br>2 Bacteria<br>3 Butter and fat content<br>4 Antibiotic residue<br>5 Other, specify<br>-99 Do not know/refuse to answer | *Select all that apply<br>*Ask if sc3_10_1=1<br>*Prompt with responses              | INDICATOR:<br>#26 |

## **SECTION 4: ANIMAL HEALTH SERVICES**

**[Transition]: Enumerator: Thank you! Now I would like to talk to you about your herd's overall health and your use of animal health services**

| VARIABLES          | ANIMAL HEALTH SERVICES                                                                                                                                                                                                                           | ENUMERATOR INSTRUCTIONS                                                | PMP INDICATORS |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------|
| sc4_1              | Did you or an animal health provider test any of your cattle for any disease in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                          | *Select only one option<br>*If sc4_1 = 2 OR sc4_1 = -99 go to sc4_6_10 |                |
| sc4_6_9_0\$1       | Were they tested for <b>Brucellosis</b> ?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                   | *Ask if sc4_1 = 1<br>*Select only one option                           |                |
| sc4_6_9_10\$1      | Who tested for <b>Brucellosis</b> ?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other (please specify)<br>-99 Do not know/refuse to answer  | *Ask if sc4_6_9_0\$1 = 1<br>*Select only one option                    |                |
| sc4_6_9_1_OTHER\$1 | Other (please specify)                                                                                                                                                                                                                           | *Ask if sc4_6_9_10\$1 = 6                                              |                |
| sc4_6_9_0\$2       | Were they tested for <b>Tuberculosis</b> ?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                  | *Ask if sc4_1 = 1<br>*Select only one option                           |                |
| sc4_6_9_10\$2      | Who tested for <b>Tuberculosis</b> ?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other (please specify)<br>-99 Do not know/refuse to answer | *Ask if sc4_6_9_0\$2 = 1<br>*Select only one option                    |                |
| sc4_6_9_1_OTHER\$2 | Other (please specify)                                                                                                                                                                                                                           | *Ask if sc4_6_9_10\$2 = 6                                              |                |
| sc4_6_9_0\$3       | Were they tested for <b>Mastitis</b> ?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                      | *Ask if sc4_1 = 1<br>*Select only one option                           |                |
| sc4_6_9_10\$3      | Who tested for <b>Mastitis</b> ?<br>1 Household member or hired worker                                                                                                                                                                           | *Ask if sc4_6_9_0\$3 = 1<br>*Select only one option                    |                |

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|                                                                                                                             | 2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other (please specify)<br>-99 Do not know/refuse to answer                                                                                      |                                                                               |               |
| <b>sc4_6_9_1_OTHER\$3</b>                                                                                                   | Other (please specify)                                                                                                                                                                                                                                  | *Ask if sc4_6_9_10\$3 = 6                                                     |               |
| <b>sc4_6_9_0\$4</b>                                                                                                         | Were they tested for <b>Tick-borne diseases</b> ?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                  | *Ask if sc4_1 = 1<br>*Select only one option                                  |               |
| <b>sc4_6_9_10\$4</b>                                                                                                        | Who tested for <b>Tick-borne diseases</b> ?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other (please specify)<br>-99 Do not know/refuse to answer | *Ask if sc4_6_9_0\$4 = 1<br>*Select only one option                           |               |
| <b>sc4_6_9_1_OTHER\$4</b>                                                                                                   | Other (please specify)                                                                                                                                                                                                                                  | *Ask if sc4_6_9_10\$4 = 6                                                     |               |
| <b>sc4_6_9_A</b>                                                                                                            | Has your cattle been tested for other diseases?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                    | *Ask if sc4_1 = 1<br>*Select only one option                                  |               |
| <b>sc4_6_9_0_OUTRO</b>                                                                                                      | Name diseases tested for:                                                                                                                                                                                                                               | *Ask if sc4_6_9_A = 1                                                         |               |
| <b>[Transition]: Enumerator: Now I would like to talk to you about any vaccinations you have done for your dairy cattle</b> |                                                                                                                                                                                                                                                         |                                                                               |               |
| <b>sc4_6_10</b>                                                                                                             | Did you vaccinate your cattle against any diseases in the past 12 months?<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                    | *Select only one option<br>*If sc4_6_10 = 2 OR sc4_6_10 = -99, go to sc4_6_12 | INDICATOR #10 |
| <b>sc4_6_11_1\$2</b>                                                                                                        | Was your cattle vaccinated for foot and mouth disease?<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                                       | *Ask if sc4_6_10 = 1<br>*Select only one option                               |               |
| <b>sc4_6_11_2\$2</b>                                                                                                        | Who vaccinated the animal?                                                                                                                                                                                                                              | *Ask if sc4_6_11_1\$2 = 1                                                     |               |



|                           |                                                                                                                                                                                                                                      |                                                         |  |
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|                           | 1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarian<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other, please specify<br>-99 Do not know/refuse to answer                               | *Select all that apply                                  |  |
| <b>sc4_6_11_2OTHER\$2</b> | Other, please specify                                                                                                                                                                                                                | *Ask if sc4_6_11_2\$2 = 6                               |  |
| <b>sc4_6_11_1\$3</b>      | Skin diseases (eg, Lump skin disease)<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                                     | *Select only one option                                 |  |
| <b>sc4_6_11_2\$3</b>      | Who vaccinated the animal?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarian<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other, please specify<br>-99 Do not know/refuse to answer | *Ask if sc4_6_11_1\$3 = 1<br><br>*Select all that apply |  |
| <b>sc4_6_11_2OTHER\$3</b> | Other, please specify                                                                                                                                                                                                                | *Ask if sc4_6_11_2\$3 = 6                               |  |
| <b>sc4_6_11_1\$4</b>      | Was your cattle vaccinated for brucellosis?<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                               | *Ask if sc4_6_10 = 1<br>*Select only one option         |  |
| <b>sc4_6_11_2\$4</b>      | Who vaccinated the animal?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarian<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other, please specify<br>-99 Do not know/refuse to answer | *Ask if sc4_6_11_1\$4 = 1<br><br>*Select all that apply |  |
| <b>sc4_6_11_2OTHER\$4</b> | Other, please specify                                                                                                                                                                                                                | *Ask if sc4_6_11_2\$4 = 6                               |  |
| <b>sc4_6_11_1\$5</b>      | Anthrax<br>1 Yes                                                                                                                                                                                                                     | *Ask if sc4_6_10 = 1<br>*Select only one option         |  |

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|                            | 2 No<br>-99 Do not know/refuse                                                                                                                                                                                                       |                                                         |  |
| <b>sc4_6_11_2\$5</b>       | Who vaccinated the animal?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarian<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other, please specify<br>-99 Do not know/refuse to answer | *Ask if sc4_6_11_1\$5 = 1<br><br>*Select all that apply |  |
| <b>sc4_6_11_2OTHE R\$5</b> | Other, please specify                                                                                                                                                                                                                | *Ask if sc4_6_11_2\$5 = 6                               |  |
| <b>sc4_6_11_1\$6</b>       | Was your cattle vaccinated for hematite carbuncle?<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                        | *Ask if sc4_6_10 = 1<br>*Select only one option         |  |
| <b>sc4_6_11_2\$6</b>       | Who vaccinated the animal?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarian<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other, please specify<br>-99 Do not know/refuse to answer | *Ask if sc4_6_11_1\$6 = 1<br><br>*Select all that apply |  |
| <b>sc4_6_11_2OTHE R\$6</b> | Other, please specify                                                                                                                                                                                                                | *Ask if sc4_6_11_2\$6 = 6                               |  |
| <b>sc4_6_11_1\$7</b>       | Was your cattle vaccinated for symptomatic carbuncle?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                           | *Ask if sc4_6_10 = 1<br>*Select only one option         |  |
| <b>sc4_6_11_2\$7</b>       | Who vaccinated the animal?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarian<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other, please specify                                     | *Ask if sc4_6_11_1\$7 = 1<br><br>*Select all that apply |  |

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|                           | -99 Do not know/refuse to answer                                                                                                                                                                                                      |                                                     |                   |
| <b>sc4_6_11_2OTHER\$7</b> | Other, please specify                                                                                                                                                                                                                 | *Ask if sc4_6_11_2\$7 = 6                           |                   |
| <b>sc4_6_11_1\$8</b>      | Was your cattle vaccinated for tuberculosis?<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                               | *Ask if sc4_6_10 = 1<br>*Select only one option     |                   |
| <b>sc4_6_11_2\$8</b>      | Who vaccinated the animal?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other, please specify<br>-99 Do not know/refuse to answer | *Ask if sc4_6_11_1\$8 = 1<br>*Select all that apply |                   |
| <b>sc4_6_11_2OTHER\$8</b> | Other, please specify                                                                                                                                                                                                                 | *Ask if sc4_6_11_2\$8 = 6                           |                   |
| <b>sc4_6_11_1\$1</b>      | Do not know – only officially required vaccinations<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                        | *Ask if sc4_6_10 = 1<br>*Select only one option     |                   |
| <b>sc4_6_11_2\$1</b>      | Who vaccinated the animal?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other, please specify<br>-99 Do not know/refuse to answer | *Ask if sc4_6_11_1\$1 = 1<br>*Select all that apply |                   |
| <b>sc4_6_11_2OTHER\$1</b> | Other, please specify                                                                                                                                                                                                                 | *Ask if sc4_6_11_2\$1 = 6                           |                   |
| <b>sc4_6_12</b>           | Did you treat your cattle against ticks in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                    | *Select only one option                             | INDICATOR:<br>#10 |

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| <b>sc4_6_13</b>            | How many days ago was the last time you treated your cattle against ticks?                                                                                                                                                                             | *Ask if sc4_6_12 = 1<br>*Enter -99 if do not know/refuse to answer |  |
| <b>sc4_6_14_2</b>          | Who applied the treatment?<br>1 Member of household or hired laborer<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other<br>-99 Do not know/refuse to answer                              | *Select all that apply                                             |  |
| <b>sc4_6_14_2_OTHER</b>    | Other, please specify                                                                                                                                                                                                                                  | *Ask if sc4_6_14_2 = 6                                             |  |
| <b>sc4_6_15</b>            | Have your cattle had any wounds or illnesses in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                | *Select only one option                                            |  |
|                            | What health problems did your cattle have over the past 12 months?                                                                                                                                                                                     | *Ask if sc4_6_15 = 1                                               |  |
| <b>sc4_6_17_1\$1</b>       | Did your cattle have mastitis in the last 12 months (July 31, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                              | *Select only one option                                            |  |
| <b>sc4_6_17_2\$1</b>       | Who treated the cattle most of the time for this condition?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other<br>-99 Do not know/refuse to answer | *Ask if sc4_6_17_1\$1<br>*Select all that apply                    |  |
| <b>sc4_6_17_2_OTHER\$1</b> | Other, please specify                                                                                                                                                                                                                                  | *Ask if sc4_6_17_2\$1 = 6                                          |  |

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| <b>sc4_6_17_3\$1</b>        | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                   | *Ask if sc4_6_17_1\$1<br>*Enter -99 if do not know/refuse to answer     |  |
| <b>sc4_6_17_1\$2</b>        | Did your cattle have any wounds in the last 12 months (July 31, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                            | *Select only one option                                                 |  |
| <b>sc4_6_17_2\$2</b>        | Who treated the cattle most of the time for this condition?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other<br>-99 Do not know/refuse to answer | *Ask if sc4_6_17_1\$2 = 1<br>*Select all that apply                     |  |
| <b>sc4_6_17_2_OTH ER\$2</b> | Other, please specify                                                                                                                                                                                                                                  | *Ask if sc4_6_17_2\$2 = 6                                               |  |
| <b>sc4_6_17_3\$2</b>        | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                   | *Ask if sc4_6_17_1\$2 = 1<br>*Enter -99 if do not know/refuse to answer |  |
| <b>sc4_6_17_1\$3</b>        | Did your cattle have conjunctivitis in the last 12 months (July 31, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                        | *Select only one option                                                 |  |
| <b>sc4_6_17_2\$3</b>        | Who treated the cattle most of the time for this condition?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other                                     | *Ask if sc4_6_17_1\$3 = 1<br>*Select all that apply                     |  |

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|                             | -99 Do not know/refuse to answer                                                                                                                                                                                                                       |                                                                         |  |
| <b>sc4_6_17_2_OTH ER\$3</b> | Other, please specify                                                                                                                                                                                                                                  | *Ask if sc4_6_17_2\$3 = 6                                               |  |
| <b>sc4_6_17_3\$3</b>        | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                   | *Ask if sc4_6_17_1\$3 = 1<br>*Enter -99 if do not know/refuse to answer |  |
| <b>sc4_6_17_1\$4</b>        | Did your cattle have Tick-borne diseases (heartwater, readwater, anaplasmosis) in the last 12 months (July 31, 2018 – June 30, 2019)?<br><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                         | *Select only one option                                                 |  |
| <b>sc4_6_17_2\$4</b>        | Who treated the cattle most of the time for this condition?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other<br>-99 Do not know/refuse to answer | *Ask if sc4_6_17_1\$4 = 1<br>*Select all that apply                     |  |
| <b>sc4_6_17_2_OTH ER\$4</b> | Other, please specify                                                                                                                                                                                                                                  | *Ask if sc4_6_17_2\$4 = 6                                               |  |
| <b>sc4_6_17_3\$4</b>        | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                   | *Ask if sc4_6_17_1\$4 = 1<br>*Enter -99 if do not know/refuse to answer |  |
| <b>sc4_6_17_1\$5</b>        | Did your cattle have diarrhea in the last 12 months (July 31, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                              | *Select only one option                                                 |  |
| <b>sc4_6_17_2\$5</b>        | Who treated the cattle most of the time for this condition?<br>1 Household member or hired worker<br>2 Promoter                                                                                                                                        | *Ask if sc4_6_17_1\$5=1<br>*Select all that apply                       |  |

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|                             | 3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other<br>-99 Do not know/refuse to answer                                                                                                                    |                                                                         |  |
| <b>sc4_6_17_2_OTH ER\$5</b> | Other, please specify                                                                                                                                                                                                                                  | *Ask if sc4_6_17_2\$5=6                                                 |  |
| <b>sc4_6_17_3\$5</b>        | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                   | *Ask if sc4_6_17_1\$5 = 1<br>*Enter -99 if do not know/refuse to answer |  |
| <b>sc4_6_17_1\$6</b>        | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                             | *Select only one option                                                 |  |
| <b>sc4_6_17_1\$6_0 UTRO</b> | Other, please specify                                                                                                                                                                                                                                  | *Ask if sc4_6_17_1\$6 = 1                                               |  |
| <b>sc4_6_17_2\$6</b>        | Who treated the cattle most of the time for this condition?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other<br>-99 Do not know/refuse to answer | *Ask if sc4_6_17_1\$6 = 1<br>*Select all that apply                     |  |
| <b>sc4_6_17_2_OTH ER\$6</b> | Other, please specify                                                                                                                                                                                                                                  | *Ask if sc4_6_17_2\$6 = 6                                               |  |
| <b>sc4_6_17_3\$6</b>        | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                   | *Ask if sc4_6_17_1\$6 = 1<br>*Enter -99 if do not know/refuse to answer |  |
| <b>sc4_6_18</b>             | Were any of your lactating cows treated with injectable antibiotics in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                         | *Select only one option                                                 |  |

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| <b>sc4_6_19</b>          | Did you withhold their milk from human consumption or sale following treatment?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                               | *Ask if sc4_6_18 = 1<br>*Select only one option                  | INDICATOR:<br>#10 |
| <b>Sc4_6_19_1</b>        | For how many days did you withhold their milk from human consumption or sale following treatment?                                                                                                                                                  | *Ask if sc4_6_19=1<br>*Enter -99 if do not know/refuse to answer |                   |
| <b>sc4_7_1_1</b>         | Have you used artificial insemination for your cows and heifers over the past 12 months (July 2018 – July 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                              | *Select only one option                                          |                   |
| <b>sc4_7_2_1_1</b>       | Who provided the service?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other<br>-99 Do not know/refuse to answer                               | *Ask if sc4_7_1_1 = 1<br>*Select all that apply                  |                   |
| <b>sc4_7_2_1_1_OUTRO</b> | Other, please specify                                                                                                                                                                                                                              | *Ask if sc4_7_2_1_1 = 6                                          |                   |
| <b>sc4_7_3_12</b>        | How easy or difficult was it for you to access artificial insemination for your dairy cattle?<br><br>1 Very easy<br>2 In a way easy<br>3 Neither easy nor difficult<br>4 Somehow difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer | *Ask if sc4_7_1_1 = 1<br>*Select only one option                 | INDICATOR:<br>#13 |
| <b>sc4_7_1_2</b>         | Have you used natural breeding services for your cows and heifers over the past 12 months (July 2018 – July 2019)?<br>1 Yes<br>2 No                                                                                                                | *Select only one option                                          |                   |



|                                                                                                            |                                                                                                                                                                                                                                                  |                                                  |                   |
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|                                                                                                            | -99 Do not know/refuse to answer                                                                                                                                                                                                                 |                                                  |                   |
| sc4_7_2_1_2                                                                                                | Who provided the service?<br>1 Household member or hired worker<br>2 Promoter<br>3 Private contracted veterinarians<br>4 Project (e.g. LOL)<br>5 Livestock Technician<br>6 Other<br>-99 Do not know/refuse to answer                             | *Ask if sc4_7_1_2 = 1<br>*Select all that apply  |                   |
| sc4_7_2_1_2_OU TRO                                                                                         | Other, please specify                                                                                                                                                                                                                            | *Ask if sc4_7_2_1_2 = 6                          |                   |
| sc4_7_3_22                                                                                                 | How easy or difficult was it for you to access natural breeding services for your dairy cattle?<br>1 Very easy<br>2 In a way easy<br>3 Neither easy nor difficult<br>4 Somehow difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer | *Ask if sc4_7_1_2 = 1<br>*Select only one option | INDICATOR:<br>#13 |
| Sc4_8_0                                                                                                    | If you wanted to buy a heifer for dairy production, how easy or difficult would it be?<br>1 Very easy<br>2 In a way easy<br>3 Neither easy nor difficult<br>4 Somehow difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer          | *Select only one option                          | INDICATOR:<br>#13 |
| sc4_8_1                                                                                                    | In general, how easy or difficult is it to access health services for your dairy cattle?<br>1 Very easy<br>2 In a way easy<br>3 Neither easy nor difficult<br>4 Somehow difficult<br>5 Very difficult<br>-99 Do not know/refuse to answer        | *Select only one option                          | INDICATOR:<br>#13 |
| <b>[Transition]: Enumerator: Now I'd like to ask you about your inputs and from where you receive them</b> |                                                                                                                                                                                                                                                  |                                                  |                   |

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| <b>sc7_5</b>         | In the last 12 months (July 1, 2018 – June 30, 2019) Did you receive any dairy inputs or services (e.g food and feed supplements, medicines, veterinary care etc.) from the Land O'Lakes MERCADO project?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option                      |  |
| <b>sc7_6</b>         | In the last 12 months (July 1, 2018 – June 30, 2019), Did you receive any dairy inputs or services from a buyer?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                          | *Select only one option                      |  |
| <b>sc7_7_1</b>       | Milk Collection Center / Cooperative<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                      | *Ask if sc7_6 = 1<br>*Select only one option |  |
| <b>sc7_7_2</b>       | Local Buyer<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                               | *Ask if sc7_6 = 1<br>*Select only one option |  |
| <b>sc7_7_3</b>       | Processor<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                 | *Ask if sc7_6 = 1<br>*Select only one option |  |
| <b>sc7_7_4</b>       | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                     | *Ask if sc7_6 = 1<br>*Select only one option |  |
| <b>sc7_7_4_OTHER</b> | Other, please specify                                                                                                                                                                                                                                          | *Ask if sc7_7_4 = 1                          |  |
|                      | What specific inputs have you received from a buyer in the last 12 months?                                                                                                                                                                                     | *Ask if sc7_6 = 1                            |  |
| <b>sc7_10_1</b>      | Food & Feed Supplements<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                   | *Select only one option                      |  |
| <b>sc7_10_2</b>      | Medicines<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                 | *Select only one option                      |  |
| <b>sc7_10_3</b>      | Veterinary care<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                           | *Select only one option                      |  |

|                       |                                                                                    |                         |  |
|-----------------------|------------------------------------------------------------------------------------|-------------------------|--|
| <b>sc7_10_4</b>       | Milk test<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                     | *Select only one option |  |
| <b>sc7_10_5</b>       | Artificial insemination<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer       | *Select only one option |  |
| <b>sc7_10_6</b>       | Village bull of the community<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option |  |
| <b>sc7_10_7</b>       | Milking utensils<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer              | *Select only one option |  |
| <b>sc7_10_8</b>       | Continuing training<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer           | *Select only one option |  |
| <b>sc7_10_9</b>       | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                         | *Select only one option |  |
| <b>sc7_10_9_OTHER</b> | Other (Specify)                                                                    | *Ask if sc7_10_9 = 1    |  |

## SECTION 5: TRAINING AND KNOWLEDGE

**[Transition]:** Enumerator: Now I would like to talk to you about any training you may have received.

| VARIABLES | TRAINING AND KNOWLEDGE                                                                                                                                                                                                                                                                                                                   | ENUMERATOR INSTRUCTIONS                                                                 | PMP INDICATORS |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------|
| sc10_1    | Are you aware of the MERCADO project led by Land O'Lakes?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                                           | *Select only one option<br>*If sc10_1 = 2, go to sc5_1                                  |                |
| sc10_2    | What kind of engagement have you had with MERCADO since October 2016?<br>1 Received trainings on dairy production<br>2 Been connected to input suppliers<br>3 Been connected to buyers and exporters<br>4 Received inputs directly<br>5 Become part of a dairy cooperativerative<br>6 Other, Specify<br>-99 Do not know/refuse to answer | *Prompt with options<br>*Select all that apply<br>*Ask if sc10_1 = 1 else skip to sc5_1 |                |
|           | Please rate the following as "Not Useful," "Little Useful," "Somewhat useful" or "Very Useful":                                                                                                                                                                                                                                          |                                                                                         |                |
| sc10_5    | Trainings on dairy production:<br>1 Very Useful<br>2 Somewhat useful<br>3 Little useful<br>4 Not useful<br>-99 Do not know/refuse to answer                                                                                                                                                                                              | *Ask if sc10_2 = 1<br>*Select only one option                                           |                |
| sc10_6    | Establishing connection to input suppliers<br>1 Very Useful<br>2 Somewhat useful<br>3 Little useful<br>4 Not useful<br>-99 Do not know/refuse to answer                                                                                                                                                                                  | *Select only one option<br>*Ask if sc10_2 = 2                                           |                |
| sc10_7    | Establishing connection to buyers and exporters<br>1 Very Useful<br>2 Somewhat useful<br>3 Little useful                                                                                                                                                                                                                                 | *Ask if sc10_2 = 3<br>*Select only one option                                           |                |

|                  |                                                                                                                                                                                                                          |                                               |  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--|
|                  | 4 Not useful<br>-99 Do not know/refuse to answer                                                                                                                                                                         |                                               |  |
| <b>sc10_8</b>    | Receiving dairy inputs directly<br>1 Very Useful<br>2 Somewhat useful<br>3 Little useful<br>4 Not useful<br>-99 Do not know/refuse to answer                                                                             | *Select only one option<br>*Ask if sc10_2 = 4 |  |
| <b>sc10_10</b>   | Becoming part of a dairy cooperative<br>1 Very Useful<br>2 Somewhat useful<br>3 Little useful<br>4 Not useful<br>-99 Do not know/refuse to answer                                                                        | *Select only one option<br>*Ask if sc10_2 = 5 |  |
| <b>Sc10_11</b>   | Have you previously worked with any project supporting the dairy industry?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                          | *Select only one option                       |  |
|                  | Which organization have you worked with?                                                                                                                                                                                 | *Ask if sc10_11 = 1                           |  |
| <b>Sc10_11_1</b> | Belgian (specify name)<br>1 Yes<br>2 No                                                                                                                                                                                  | *Ask if sc10_11=1<br>*Select only one option  |  |
| <b>Sc10_11_2</b> | German (specify name)<br>1 Yes<br>2 No                                                                                                                                                                                   | *Ask if sc10_11=1<br>*Select only one option  |  |
| <b>Sc10_11_3</b> | Mozambican government (specify name)<br>1 Yes<br>2 No                                                                                                                                                                    | *Ask if sc10_11=1<br>*Select only one option  |  |
| <b>Sc10_11_4</b> | Land O Lakes<br>1 Yes<br>2 No                                                                                                                                                                                            | *Ask if sc10_11=1<br>*Select only one option  |  |
| <b>Sc10_11_4</b> | Other (specify name)<br>1 Yes<br>2 No                                                                                                                                                                                    | *Ask if sc10_11=1<br>*Select only one option  |  |
| <b>sc5_1</b>     | Has anyone in your household or an employee received Land O'Lakes/MERCADO training in dairy cattle management in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Ask if sc10_2 = 1<br>*Select only one option |  |

|                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                      |                                              |                   |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|
| Sc5_1_1                                                                                            | What kind of trainings have you received in the last 12 months?<br>1. Training on improved farm practices<br>2. Fodder production<br>3. Improved dairy husbandry<br>4. Improved farm management<br>5. Improved agricultural productivity<br>6. Input supply<br>7. Post-harvest handling<br>8. Food security<br>9. Other, specify<br>-99 Do not know/refuse to answer | *Ask if sc5_1 = 1<br>*Select all that apply  |                   |
| sc5_2                                                                                              | Who has received this training?<br>1. Repondent<br>2. Respondent's spouse<br>3. Another adult male member of the household<br>4. Other household adult female member of the household<br>5. Farm employee<br>6. Other<br>-99 Do not know/refuse to answer                                                                                                            | *Ask if sc5_1 = 1<br>*Select only one option |                   |
| sc5_3                                                                                              | Second party to receive training<br>1. Repondent<br>2. Respondent's spouse<br>3. Another adult male member of the household<br>4. Other household adult female member of the household<br>5. Farm employee<br>6. Other<br>-99 Do not know/refuse to answer                                                                                                           | *Ask if sc5_1 = 1<br>*Select only one option |                   |
| <b>[Transition]: Enumerator: Now we want to ask you some questions about what you have learned</b> |                                                                                                                                                                                                                                                                                                                                                                      |                                              |                   |
|                                                                                                    | What are two activities that you can do to improve pasture quality?                                                                                                                                                                                                                                                                                                  | *Do not prompt with options                  |                   |
| sc5_4_1                                                                                            | Controlling the weeds<br>1. Yes<br>2. No                                                                                                                                                                                                                                                                                                                             | *Select only one option                      | INDICATOR:<br>#17 |
| sc5_4_2                                                                                            | Fertilize the field with potassium once a year (if the field has a sandy soil)<br>1. Yes<br>2. No                                                                                                                                                                                                                                                                    | *Select only one option                      | INDICATOR:<br>#17 |

|                      |                                                                                                                             |                             |                   |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------|
| <b>sc5_4_3</b>       | Rotate between grass and vegetables<br>1 Yes<br>2 No                                                                        | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_4_4</b>       | Seal the field to eliminate entry of unwanted animals<br>1 Yes<br>2 No                                                      | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_4_5</b>       | Cut the grass (with a scythe, animal scythe or reaper)<br>1 Yes<br>2 No                                                     | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_4_6</b>       | Other<br>1 Yes<br>2 No                                                                                                      | *Select only one option     |                   |
|                      | Please list the advantages of artificial insemination                                                                       | *Do not prompt with options |                   |
| <b>sc5_5_1</b>       | No need to have access to an ox / male / bull<br>1 Yes<br>2 No                                                              | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_5_2</b>       | No risk of transmission of sickness<br>1 Yes<br>2 No                                                                        | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_5_3</b>       | The offspring will have predictable genetic material<br>1 Yes<br>2 No                                                       | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_5_4</b>       | Having power to decide when and what you want your cows to achieve<br>1 Yes<br>2 No                                         | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_5_5</b>       | It is more economical to buy semen than to keep an ox / male / bull<br>1 Yes<br>2 No                                        | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_5_6</b>       | You can choose from males from all over the world, depending on the characteristics you need for your herd<br>1 Yes<br>2 No | *Select only one option     | INDICATOR:<br>#17 |
| <b>sc5_5_7</b>       | Other<br>1 Yes<br>2 No                                                                                                      | *Select only one option     |                   |
| <b>sc5_5_7_OUTRO</b> | Other, please specify                                                                                                       | *Ask if sc5_5_7 = 1         |                   |

|               |                                                                                         |                             |                   |
|---------------|-----------------------------------------------------------------------------------------|-----------------------------|-------------------|
|               | What data or information would you need to estimate the profit from your dairy business | *Do not prompt with options |                   |
| sc5_6_1       | Revenue<br>1 Yes<br>2 No                                                                | *Select only one option     | INDICATOR:<br>#18 |
| sc5_6_2       | Expenses<br>1 Yes<br>2 No                                                               | *Select only one option     | INDICATOR:<br>#18 |
| sc5_6_3       | Other<br>1 Yes<br>2 No                                                                  | *Select only one option     |                   |
| sc5_6_3_OUTRO | Other, please specify                                                                   | *Ask if sc5_6_3 = 1         |                   |
|               | What are the most important equipment or areas to have in the Kraal                     | *Do not prompt with options |                   |
| sc5_7_1       | Feeder / food receptacle<br>1 Yes<br>2 No                                               | *Select only one option     | INDICATOR:<br>#17 |
| sc5_7_2       | Water cooler / water receptacle<br>1 Yes<br>2 No                                        | *Select only one option     | INDICATOR:<br>#17 |
| sc5_7_3       | Sheet / cover to give shade<br>1 Yes<br>2 No                                            | *Select only one option     | INDICATOR:<br>#17 |
| sc5_7_4       | Cement in the milking area<br>1 Yes<br>2 No                                             | *Select only one option     | INDICATOR:<br>#17 |
| sc5_7_5       | A dry ground<br>1 Yes<br>2 No                                                           | *Select only one option     | INDICATOR:<br>#17 |
|               | Please provide us with ways of preventing or controlling mastitis                       | *Do not prompt with options |                   |
| sc5_8_1       | Disinfect the udder and teats before milking<br>1 Yes<br>2 No                           | *Select only one option     | INDICATOR:<br>#17 |
| sc5_8_2       | Keep milking equipment clean and in good condition<br>1 Yes<br>2 No                     | *Select only one option     | INDICATOR:<br>#17 |
| sc5_8_3       | Wash hands before and after milking each cow                                            | *Select only one option     | INDICATOR:<br>#17 |



|                |                                                                                                                                                                                                                 |                                                       |                   |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------|
|                | 1 Yes<br>2 No                                                                                                                                                                                                   |                                                       |                   |
| sc5_8_4        | Disinfecting the udder and teats after milking<br>1 Yes<br>2 No                                                                                                                                                 | *Select only one option                               | INDICATOR:<br>#17 |
| sc5_8_5        | Feed the cows immediately after milking, and ensure they have access to clean water<br>1 Yes<br>2 No                                                                                                            | *Select only one option                               | INDICATOR:<br>#17 |
| sc5_8_6        | Treat mastitis using veterinary products or services<br>1 Yes<br>2 No                                                                                                                                           | *Select only one option                               | INDICATOR:<br>#17 |
| sc5_8_7        | Keep cows that frequently suffer from mastitis away from other<br>1 Yes<br>2 No                                                                                                                                 | *Select only one option                               | INDICATOR:<br>#17 |
| sc5_8_8        | Milking the cows with mastitis after the other cows<br>1 Yes<br>2 No                                                                                                                                            | *Select only one option                               | INDICATOR:<br>#17 |
| sc5_8_9        | Keep cows as clean as possible<br>1 Yes<br>2 No                                                                                                                                                                 | *Select only one option                               | INDICATOR:<br>#17 |
| sc5_8_10       | Give dry cow therapy to dry cows<br>1 Yes<br>2 No                                                                                                                                                               | *Select only one option                               | INDICATOR:<br>#17 |
| sc5_8_11       | Keep the Kraal and place of the cleaned calf<br>1 Yes<br>2 No                                                                                                                                                   | *Select only one option                               | INDICATOR:<br>#17 |
| sc5_8_12       | Other<br>1 Yes<br>2 No                                                                                                                                                                                          | *Select only one option                               |                   |
| sc5_8_12_OUTRO | Other (Specify)                                                                                                                                                                                                 | *Ask of sc5_8_12=1                                    |                   |
| Sc5_10_1       | What are best practices in cow feeding?<br>1 Adequate grass for grazing<br>2 Mineral supplementation<br>3 Fodder/forage<br>4 Continuous access to water<br>5 Other, specify<br>-99 Do not know/refuse to answer | *Do not prompt with options<br>*Select all that apply | INDICATOR:<br>#17 |
| Sc5_10_2       | What are the advantages of keeping the kraal hygienic?<br>1 Milk will not get contaminated                                                                                                                      | *Do not prompt with options<br>*Select all that apply | INDICATOR:<br>#17 |

|                 |                                                                                                                                                                                                                                                               |                                                        |                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------|
|                 | 2 Animal will be less susceptible to diseases<br>3 Other, specify<br>-99 Do not know/refuse to answer                                                                                                                                                         |                                                        |                   |
| <b>Sc5_10_3</b> | In what ways can the quality of milk be maintained?<br>1 Maintain a hygienic kraal<br>2 Weekly tick treatments<br>3 Vaccinations<br>4 Use of steel receptacles for milk<br>5 Use of a milking machine<br>6 Other, specify<br>-99 Do not know/refuse to answer | *Do not prompt with options<br>*Select all that apply  | INDICATOR:<br>#17 |
| <b>Sc5_10_4</b> | Do you currently create a budget for farm operations?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                    | *Do not prompt with options<br>*Select only one option | INDICATOR:<br>#18 |
| <b>Sc5_10_5</b> | What are the contents of a business plan?<br>1 Financial plan<br>2 Breakdown of products and services<br>3 Production plan<br>4 Sales plan<br>5 Other, specify<br>-99 Do not know/refuse to answer                                                            | *Do not prompt with options<br>*Select all that apply  | INDICATOR:<br>#18 |
| <b>Sc5_10_6</b> | What types of record should a dairy farmer keep?<br>1 Production records<br>2 Feeding records<br>3 Sales records<br>4 Calving records<br>5 Health records<br>6 Mortality records<br>7 Other, specify<br>-99 Do not know/refuse to answer                      | *Do not prompt with options<br>*Select all that apply  | INDICATOR:<br>#18 |

## **SECTION 6: LABOR, ROLES, AND RESPONSIBILITIES**

**[Transition]:** Enumerator: Now I want to talk to you about the labor employed by you and the division of labor on your farm.

| VARIABLES         | LABOR, ROLES AND RESPONSIBILITIES                                                                                                                                                                     | ENUMERATOR INSTRUCTIONS                                                                            | PMP INDICATOR |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------|
|                   | In the past 12 months, how many employees of the different types did you have for dairy activities or fodder production                                                                               | *Please enter 0 if did not use                                                                     |               |
| sc6_3_1_1_MALE    | Full time permanent - Male                                                                                                                                                                            | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_3_1_1_FEMALE  | Full-time permanent - Female                                                                                                                                                                          | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_3_1_2_MALE    | Part Time Permanent - Male                                                                                                                                                                            | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_3_1_2_FEMALE  | Part time permanent – Female                                                                                                                                                                          | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_3_1_3_MALE    | Full-time seasonal – Male                                                                                                                                                                             | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_3_1_3_FEMALE  | Full-time seasonal- Female                                                                                                                                                                            | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_3_1_4_MALE    | Part Time seasonal - Male                                                                                                                                                                             | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_3_1_4_FEMALE  | Part Time seasonal - Female                                                                                                                                                                           | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
|                   | How many new employees for each of the following types (from variables sc6_31_1_1_MALE to sc6_31_1_4_FEMALE), did you hire in the past 12 months as a result of participation in the MERCADO project? | *Please enter 0 if no new employees were hired as a result of participation in the MERCADO project |               |
| sc6_31_1_1_MALE   | Full time permanent – Male                                                                                                                                                                            | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_31_1_1_FEMALE | Full-time permanent – Female                                                                                                                                                                          | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_31_1_2_MALE   | Part-Time Permanent – Male                                                                                                                                                                            | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_31_1_2_FEMALE | Part-time permanent - Female                                                                                                                                                                          | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |
| sc6_31_1_3_MALE   | Full-time seasonal – Male                                                                                                                                                                             | *Enter -99 if Do not know/refuse to answer                                                         | INDICATOR: #3 |

|                                                                                                        |                                                                                                                                                                                                              |                                            |               |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------|
| sc6_31_1_3_FEMALE                                                                                      | Full-Time seasonal – Female                                                                                                                                                                                  | *Enter -99 if Do not know/refuse to answer | INDICATOR: #3 |
| sc6_31_1_4_MALE                                                                                        | Part-Time seasonal – Male                                                                                                                                                                                    | *Enter -99 if Do not know/refuse to answer | INDICATOR: #3 |
| sc6_31_1_4_FEMALE                                                                                      | Part-Time seasonal – Female                                                                                                                                                                                  | *Enter -99 if Do not know/refuse to answer | INDICATOR: #3 |
| sc6_3_2                                                                                                | On average, how many hours per week does a part-time employee work?                                                                                                                                          | *Enter -99 if Do not know/refuse to answer |               |
| sc6_3_3_1                                                                                              | On average, how many weeks of the year does a seasonal worker work?                                                                                                                                          | *Enter -99 if Do not know/refuse to answer |               |
| <b>[Transition]: Enumerator: Now we would like to ask you about the division of labor on your farm</b> |                                                                                                                                                                                                              |                                            |               |
|                                                                                                        | Who is primarily responsible for doing the following activities in your dairy production?                                                                                                                    | *Read out all options                      |               |
| sc6_3_4_1                                                                                              | Fodder production (sowing or planting)<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer | *Select all that apply                     |               |
| sc6_3_4_2                                                                                              | Cleaning the kraal<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                     | *Select all that apply                     |               |
| sc6_3_4_3                                                                                              | Kraal building<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                         | *Select all that apply                     |               |
| sc6_3_4_4                                                                                              | Purchase of products for cows (ration, medicines)<br>1 Adult household man<br>2 Adult household woman                                                                                                        | *Select all that apply                     |               |

|                  |                                                                                                                                                                                                            |                        |  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|
|                  | 3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                                                                                             |                        |  |
| <b>sc6_3_4_5</b> | Kraal maintenance<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                    | *Select all that apply |  |
| <b>sc6_3_4_6</b> | Cuts and takes fodder to the Kraal<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer   | *Select all that apply |  |
| <b>sc6_3_4_7</b> | Cut fodder so the animals can eat<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer    | *Select all that apply |  |
| <b>sc6_3_4_8</b> | Transport of milk to the cooperative<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer | *Select all that apply |  |
| <b>sc6_3_4_9</b> | Take the animals for grazing and water points<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed                            | *Select all that apply |  |

|                   |                                                                                                                                                                                                               |                        |  |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|
|                   | -99 Do not know/refuse to answer                                                                                                                                                                              |                        |  |
| <b>sc6_3_4_10</b> | Estrus detection<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                        | *Select all that apply |  |
| <b>sc6_3_4_11</b> | Cleaning of milking devices<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer             | *Select all that apply |  |
| <b>sc6_3_4_12</b> | Recordkeeping<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                           | *Select all that apply |  |
| <b>sc6_3_4_13</b> | Receive money from the milk cooperative<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer | *Select all that apply |  |
|                   | Who makes the final decision on the following activities?                                                                                                                                                     | *Read out all options  |  |
| <b>sc6_5_1</b>    | Allocation of milk sales revenues<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer       | *Select all that apply |  |

|                |                                                                                                                                                                                                                                                          |                        |  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|
| <b>sc6_5_2</b> | Distribution of dairy activities (lawn mowing, Kraal cleaning, feeding of animals)<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer | *Select all that apply |  |
| <b>sc6_5_3</b> | Buying a Cow<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                                                                       | *Select all that apply |  |
| <b>sc6_5_4</b> | Purchases of products or equipment<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                                                 | *Select all that apply |  |
| <b>sc6_5_5</b> | Distribution of household activities<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                                               | *Select all that apply |  |
| <b>sc6_5_6</b> | How to use crop revenues<br>1 Adult household man<br>2 Adult household woman<br>3 Boys<br>4 Girls<br>5 Paid worker<br>6 Nobody does/Activity not performed<br>-99 Do not know/refuse to answer                                                           | *Select all that apply |  |

## SECTION 7: PRODUCTION, DISPOSITION AND REVENUE

**[Transition]:** Enumerator: Now I have a few questions about the production of milk, and how you use it. It may be that it will be easier to answer these questions by referring to your book of records.

| VARIABLES                                                                                                                                                                     | PRODUCTION, DISPOSITION AND REVENUE                                                                                                                            | ENUMERATOR INSTRUCTIONS                                                                                                             | PMP INDICATOR  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------|
| sc7_04                                                                                                                                                                        | Do you keep a record of daily milk production?<br>1 Yes<br>2 No                                                                                                | *Select only one option<br>*If they say yes, confirm from inspecting the record book                                                | INDICATOR: #12 |
| sc7_05                                                                                                                                                                        | Do you keep a record of how you allocate milk to different sources?<br>1 Yes<br>2 No                                                                           | *Select only one option<br>*If they say yes, confirm from inspecting the record book                                                | INDICATOR: #12 |
| sc7_06                                                                                                                                                                        | Do you keep a record of farm transactions (expenses and receipts)?<br>1 Yes<br>2 No                                                                            | *Select only one option<br>*If they say yes, confirm from inspecting the record book                                                | INDICATOR: #12 |
| sc7_07                                                                                                                                                                        | Do you keep a record of registration of animal health visits ?<br>1 Yes<br>2 No                                                                                | *Select only one option<br>*If they say yes, confirm from inspecting the record book                                                | INDICATOR: #12 |
| Sc7_08                                                                                                                                                                        | Do you keep a record of dairy sales?<br>1 Yes<br>2 No                                                                                                          | *Select only one option<br>*If they say yes, confirm from inspecting the record book                                                | INDICATOR: #12 |
| <b>[Transition]:</b> Enumerator: Now think only about the production and sales of milk YESTERDAY. To the extent possible fill out sc7_3_1_1 - sc7_4_7_2 using the record book |                                                                                                                                                                |                                                                                                                                     |                |
| sc7_2_1_1                                                                                                                                                                     | How many cows were producing yesterday?                                                                                                                        | *Enter "0" if no cows were producing milk yesterday<br>*Enter -99 if Do not know/refuse to answer                                   | INDICATOR: #7  |
| Sc7_2_1_2                                                                                                                                                                     | Does the record book have information on the total volume of milk produced yesterday by all of your cows?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option<br>*Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1 |                |
| sc7_2_1_3                                                                                                                                                                     | How much total milk produced did your cows produce yesterday (both morning                                                                                     | *Ask if sc7_3_1_1>0<br>*Enter in liters                                                                                             | INDICATOR: #7  |



|            |                                                                                                                               |                                                                                                                                           |                       |
|------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|            | and evening milking)? Think about the total milk produced by all of your cows.                                                | *Enter -99 if Do not know/refuse to answer<br>*If sc7_3_2_1_RECORD = 1, then fill from record book; else ask the respondents and fill out |                       |
|            | How did you distribute the milk collected yesterday for different uses?                                                       |                                                                                                                                           |                       |
| sc7_2_1_4  | Consumption at home - yesterday (liters)                                                                                      | *Enter -99 if Do not know/refuse to answer                                                                                                |                       |
| sc7_2_1_5  | Milk given to the offspring – yesterday (liters)                                                                              | *Enter -99 if Do not know/refuse to answer                                                                                                |                       |
| sc7_2_1_6  | Milk sold to milk collection center / cooperative - yesterday (liters)                                                        | *Enter -99 if Do not know/refuse to answer                                                                                                | INDICATORS:<br>#1; #2 |
| sc7_2_1_7  | Milk sold to milk collection center/ cooperative - What was the price per liter of milk you received yesterday?               | *Enter -99 if Do not know/refuse to answer<br>*Enter in Metical                                                                           | INDICATORS:<br>#1, #2 |
| sc7_2_1_8  | Which cooperative did you sell the milk produced yesterday? Please specify the name.                                          | *Enter -99 if do not know/refuse to answer<br>*If sold to multiple cooperatives, enter most important one                                 |                       |
| sc7_2_1_9  | Milk sold to processors - yesterday (liters)                                                                                  | *Enter -99 if Do not know/refuse to answer                                                                                                | INDICATORS:<br>#1; #2 |
| sc7_2_1_10 | Milk sold to processors - What price did you receive per liter of milk you sold yesterday?                                    | *Enter -99 if Do not know/refuse to answer<br>*Enter in Metical                                                                           | INDICATOR: #1         |
| sc7_2_1_11 | Which processor did you sell the milk produced yesterday? Please specify the name.                                            | *Enter -99 if do not know/refuse to answer<br>*If sold to multiple processors, enter most important one                                   |                       |
| sc7_2_1_12 | Milk sold locally (neighbors, occasional buyers, etc.) – yesterday - (liters)                                                 | *Enter -99 if Do not know/refuse to answer                                                                                                | INDICATORS:<br>#1; #2 |
| sc7_2_1_13 | Milk sold locally (neighbors, occasional buyers, etc.) – What was the average price you received per liter of milk yesterday? | *Enter -99 if Do not know/refuse to answer<br>*Enter in Metical                                                                           | INDICATOR: #1         |
| sc7_2_1_14 | Milk lost (waste, etc.) - yesterday (liters)                                                                                  | *Enter -99 if Do not know/refuse to answer                                                                                                |                       |
| sc7_2_1_15 | Other (Specify)                                                                                                               | *Enter -99 if Do not know/refuse to answer                                                                                                | INDICATOR: #1         |
| sc7_2_1_16 | Other – yesterday (liters)                                                                                                    | *Enter -99 if Do not know/refuse to answer                                                                                                | INDICATORS:<br>#1; #2 |

|                                                                                                                                   |                                                                                                                                                                                                                 |                                                                                                                                     |                    |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| sc7_2_1_17                                                                                                                        | Other - What was the per liter value of milk you received yesterday?                                                                                                                                            | *Enter -99 if Do not know/refuse to answer<br>*Enter in Metical                                                                     | INDICATOR: #1      |
| sc7_2_1_18                                                                                                                        | Total - yesterday (liters)                                                                                                                                                                                      | *Enter -99 if Do not know/refuse to answer                                                                                          | INDICATOR: #1      |
| <b>[Transition]: Enumerator: Now think about ALL the milk produced and sold in the last dry season (May through October 2018)</b> |                                                                                                                                                                                                                 |                                                                                                                                     |                    |
| Sc7_3_1_1                                                                                                                         | On average, how many cows were producing milk on a daily basis in the last dry season (May through October 2018)?                                                                                               | *Enter -99 if do not know/refuse to answer                                                                                          |                    |
| Sc7_3_1_2                                                                                                                         | Does the record book have information on the total volume of milk produced on a daily basis in the last dry season (May through October 2018)?<br>1 Yes<br>3 No<br>-99 Do not know/refuse to answer             | *Select only one option<br>*Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1 |                    |
| sc7_3_1_3                                                                                                                         | Overage, how much total milk did your cows produce on a daily basis in the last dry season (May through October 2018). Think about the total milk produced by all cows on a daily basis in the last dry season. | *Enter in liters<br>*Enter -99 if Do not know/refuse to answer                                                                      | INDICATOR: #7      |
|                                                                                                                                   | How did you distribute the milk collected at different times for different uses in the last dry season (May through October 2018)?                                                                              |                                                                                                                                     |                    |
| sc7_3_1_4                                                                                                                         | Consumption at home - Dry season (May through October 2018) (liters)                                                                                                                                            | *Enter -99 if Do not know/refuse to answer                                                                                          |                    |
| sc7_3_1_5                                                                                                                         | Milk given to the offspring - Dry season (May through October 2018) (liters)                                                                                                                                    | *Enter -99 if Do not know/refuse to answer                                                                                          |                    |
| sc7_3_1_6                                                                                                                         | Milk sold to milk collection center / cooperative - Dry season (May through October 2018) (liters)                                                                                                              | *Enter -99 if Do not know/refuse to answer                                                                                          | INDICATORS: #1; #2 |
| Sc7_3_1_7                                                                                                                         | Milk sold to milk collection center/ cooperative - What was the average price per liter of milk you received in the dry season (May through October 2018)?                                                      | *Enter -99 if Do not know/refuse to answer<br>*Enter in Metical                                                                     | INDICATORS: #1, #2 |
| sc7_3_1_8                                                                                                                         | Which cooperative did you sell the milk produced in the last dry season (May through October 2018)? Please specify the name.                                                                                    | *Enter -99 if do not know/refuse to answer                                                                                          |                    |

|                                                                                                                                             |                                                                                                                                                                        |                                                                                                         |                    |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------|
|                                                                                                                                             |                                                                                                                                                                        | *If sold to multiple cooperatives, enter most important one                                             |                    |
| sc7_3_1_9                                                                                                                                   | Milk sold to processors - Dry season (May through October 2018) (liters)                                                                                               | *Enter -99 if Do not know/refuse to answer                                                              | INDICATORS: #1; #2 |
| sc7_3_1_10                                                                                                                                  | Milk sold to processors - What price did you receive per liter of milk you sold in the dry season (May through October 2018)?                                          | *Enter -99 if Do not know/refuse to answer<br>*Enter in Metical                                         | INDICATOR: #1      |
| sc7_3_1_11                                                                                                                                  | Which processor did you sell the milk produced in the last dry season (May through October 2018)? Please specify the name.                                             | *Enter -99 if do not know/refuse to answer<br>*If sold to multiple processors, enter most important one |                    |
| sc7_3_1_12                                                                                                                                  | Milk sold locally (neighbors, occasional buyers, etc.) - Dry season (May through October 2018) (liters)                                                                | *Enter -99 if Do not know/refuse to answer                                                              | INDICATORS: #1; #2 |
| sc7_3_1_13                                                                                                                                  | Milk sold locally (neighbors, occasional buyers, etc.) – What was the average price you received per liter of milk in the last dry season (May through October 2018) ? | *Enter -99 if Do not know/refuse to answer<br>*Enter in Metical                                         | INDICATOR: #1      |
| sc7_3_1_14                                                                                                                                  | Milk lost (waste, etc.) - Dry season (May through October 2018) (liters)                                                                                               | *Enter -99 if Do not know/refuse to answer                                                              |                    |
| sc7_3_1_15                                                                                                                                  | Other (Specify)                                                                                                                                                        | *Enter -99 if Do not know/refuse to answer                                                              | INDICATOR: #1      |
| sc7_3_1_16                                                                                                                                  | Other - Dry season (May through October 2018) (liters)                                                                                                                 | *Enter -99 if Do not know/refuse to answer                                                              | INDICATORS: #1; #2 |
| sc7_3_1_17                                                                                                                                  | Other - What was the per liter value of milk in the last dry season (May through October 2018)?                                                                        | *Enter -99 if Do not know/refuse to answer<br>*Enter in Metical                                         | INDICATOR: #1      |
| sc7_3_1_18                                                                                                                                  | Total - Dry season in the last 12 months (May through October 2018) (liters)                                                                                           | *Enter -99 if Do not know/refuse to answer                                                              | INDICATOR: #1      |
| <b>[Transition]: Enumerator: Now think about ALL the milk produced and sold in the last rainy season (November 2018 through April 2019)</b> |                                                                                                                                                                        |                                                                                                         |                    |
| Sc7_4_1_1                                                                                                                                   | On average, how many cows were producing milk on a daily basis in the last rainy season (November 2018 through April 2019)?                                            | *Enter -99 if do not know/refuse to answer                                                              |                    |
| Sc7_4_1_2                                                                                                                                   | Does the record book have information on the total volume of milk produced on a daily basis in the last rainy season (November 2018 through April 2019)?               | *Select only one option                                                                                 |                    |

|                  |                                                                                                                                                                                                                              |                                                                                                                                      |                       |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                  | 1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                            | *Ask if<br>SC2_7_0_REC<br>ORD\$1 = 1 OR<br>SC2_7_0_REC<br>ORD\$2 = 1 OR<br>SC2_7_0_REC<br>ORD\$3 = 1 OR<br>SC2_7_0_REC<br>ORD\$4 = 1 |                       |
| <b>sc7_4_1_3</b> | On average, how much milk did your cows produce on a daily basis in the last rainy season (November 2018 to April 2019) (liters). Think about the total milk produced by all cows on a daily basis in the last rainy season. | *Enter in liters<br>*Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                              | INDICATOR:<br>#7      |
|                  | How did you distribute the milk collected at different times for different uses in the last rainy season (November 2018 through April 2019)?                                                                                 |                                                                                                                                      |                       |
| <b>sc7_4_1_4</b> | Consumption at home - Rainy season (November 2018 through April 2019) (liters)                                                                                                                                               | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                                  |                       |
| <b>sc7_4_1_5</b> | Milk given to the offspring - Rainy season (november to april) (liters)                                                                                                                                                      | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                                  |                       |
| <b>sc7_4_1_6</b> | Milk sold to milk collection center/ cooperative - Rainy season (November 2018 through April 2019) (liters)                                                                                                                  | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                                  | INDICATORS:<br>#1; #2 |
| <b>sc7_4_1_7</b> | Milk sold to milk collection center/ cooperative - What was the average price per liter of milk you received in the rainy season (November 2018 through April 2019)?                                                         | *Enter -99 if<br>Do not<br>know/refuse<br>to answer<br>*Enter in<br>Metical                                                          | INDICATORS:<br>#1, #2 |
| <b>sc7_4_1_8</b> | Which cooperative did you sell the milk produced in the last rainy season (November 2018 through April 2019)? Please specify the name.                                                                                       | *Enter -99 if<br>do not<br>know/refuse<br>to answer<br>*If sold to<br>multiple<br>cooperatives,<br>enter most<br>important one       |                       |

|                   |                                                                                                                                                                                 |                                                                                                                              |                       |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>sc7_4_1_9</b>  | Milk sold to processors - Rainy season (November to April) (liters)                                                                                                             | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                          | INDICATORS:<br>#1; #2 |
| <b>sc7_4_1_10</b> | Milk sold to processors - What price did you receive per liter of milk you sold in the rainy season (November 2018 through April 2019)?                                         | *Enter -99 if<br>Do not<br>know/refuse<br>to answer<br>*Enter in<br>Metical                                                  | INDICATOR:<br>#1      |
| <b>sc7_4_1_11</b> | Which processor did you sell the milk produced in the last rainy season (November 2018 through April 2019)? Please specify the name.                                            | *Enter -99 if<br>do not<br>know/refuse<br>to answer<br>*If sold to<br>multiple<br>processors,<br>enter most<br>important one |                       |
| <b>sc7_4_1_12</b> | Milk sold locally (neighbors, occasional buyers, etc.) - Rainy season (November 2018 through April 2019) (liters)                                                               | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                          | INDICATORS:<br>#1; #2 |
| <b>sc7_4_1_13</b> | Milk sold locally (neighbors, occasional buyers, etc.) – What was the average price you received per liter of milk in the last rainy season (November 2018 through April 2019)? | *Enter -99 if<br>Do not<br>know/refuse<br>to answer<br>*Enter in<br>Metical                                                  | INDICATOR:<br>#1      |
| <b>sc7_4_1_14</b> | Milk lost (waste, etc.) - Rainy season (November 2018 through April 2019) (liters)                                                                                              | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                          |                       |
| <b>sc7_4_1_15</b> | Other (Specify)                                                                                                                                                                 | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                          | INDICATOR:<br>#1      |
| <b>sc7_4_1_16</b> | Other - Rainy season (November 2018 through April 2019) (liters)                                                                                                                | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                          | INDICATORS:<br>#1; #2 |
| <b>sc7_4_1_17</b> | Other - What was the per liter value of milk in the rainy season (November 2018 through April 2019)?                                                                            | *Enter -99 if<br>Do not<br>know/refuse<br>to answer                                                                          | INDICATOR:<br>#1      |

|                                                                                             |                                                                                                                                                          |                                                                  |               |
|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------|
|                                                                                             |                                                                                                                                                          | *Enter in Metical                                                |               |
| <b>sc7_4_1_18</b>                                                                           | Total - Rainy season in the last 12 months (November 2018 through April 2019) (liters)                                                                   | *Enter -99 if Do not know/refuse to answer                       | INDICATOR: #1 |
| <b>[Transition]: Enumerator: Now I would like to ask about the quality of milk you sell</b> |                                                                                                                                                          |                                                                  |               |
| <b>sc7_11</b>                                                                               | Have you ever had milk refused by a buyer in the past twelve months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option                                          |               |
| <b>sc7_12</b>                                                                               | How many times has the milk been refused in the past 12 months between July 1, 2018 – June 30, 2019?                                                     | *Ask if sc7_11 = 1<br>*Enter -99 if Do not know/refuse to answer |               |
|                                                                                             | What were the reasons for milk rejection?                                                                                                                | *Ask if sc7_11 = 1                                               |               |
| <b>sc7_13_1</b>                                                                             | Mastitis<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                            | *Ask if sc7_11 = 1<br>*Select only one option                    |               |
| <b>sc7_13_2</b>                                                                             | Milk had been boiled<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                | *Ask if sc7_11 = 1<br>*Select only one option                    |               |
| <b>sc7_13_3</b>                                                                             | Water was added to milk<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                             | *Ask if sc7_11 = 1<br>*Select only one option                    |               |
| <b>sc7_13_4</b>                                                                             | Other<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                               | *Ask if sc7_11 = 1<br>*Select only one option                    |               |
| <b>sc7_13_3_OTHER</b>                                                                       | Other, please specify                                                                                                                                    | *Ask if sc7_13_3 = 1                                             |               |

## SECTION 8: FINANCE AND INVESTMENTS

**[Transition]: Enumerator: Now we would like to ask about your finance and investments.**

| VARIABLES | FINANCE AND INVESTMENTS                                                                                                                                                                                                                                                                                                                               | ENUMERATOR INSTRUCTIONS                                                              | PMP INDICATOR  |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------|
| sc8_1     | Has your household made any investment in the milk business in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                | *Select only one option                                                              | INDICATOR: #24 |
| sc8_1_1   | What investments did you make?<br>1 Build/maintain infrastructure for cattle<br>2 Purchase/maintain new equipment or machinery<br>3 Purchase cattle<br>4 Purchase different livestock (other than cattle)<br>5 Purchase feed/veterinary care or other such inputs<br>6 Paying off other debts<br>7 Other, specify<br>-99 Do not know/refuse to answer | *Ask if sc8_1 = 1<br>*Select all that apply                                          |                |
| sc8_1_2   | How much money did you invest in this(these)?                                                                                                                                                                                                                                                                                                         | *Enter -99 if Do not know/refuse to answer<br>*Ask if sc8_1 = 1<br>*Enter in Metical | INDICATOR: #1  |
| sc8_1_3   | What was the source of funding?<br>1 Self / auto financing<br>2 Informal family, neighbors, friends)<br>3 Formal loan (bank)<br>4 MERCADO Grant/Award<br>5 VSLA<br>6 Other Grant / Award<br>-99 Do not know/refuse to answer                                                                                                                          | *Select all that apply<br>*Ask if sc8_1 = 1                                          |                |

## SECTION 9: EFFECTS OF CYCLONE IDAI

**[Transition]:** Enumerator: Thank you for your responses thus far. Now, we would like to learn about the effects on your dairy farm production due to Cyclone Idai. We will ask about how it has influenced your cattle, dairy production, and sales.

| VARIABLES                                                          | EFFECTS OF CYCLONE IDAI                                                                                                                                                                               | ENUMERATOR INSTRUCTIONS                                                                                            | PMP INDICATOR |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------|
| sc9_1                                                              | Did you lose any dairy cattle due to Cyclone Idai?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                               | *Select only one option                                                                                            |               |
| sc9_2\$1<br>sc9_2\$2<br>sc9_2\$3<br>sc9_2\$4<br>sc9_2\$5           | How many dairy cattle did you lose due to Cyclone Idai?<br>1 Bulls _____<br>2 Cows _____<br>3 Heifers _____<br>4 Female calves _____<br>5 Male calves _____                                           | *Ask if sc9_1 = 1<br>*Enter -99 if do not know/refuse to answer<br>*Enter 0 if cattle type not lost                |               |
| sc9_3                                                              | Did any of your dairy cattle succumb to disease after Cyclone Idai?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                              | *Select only one option                                                                                            |               |
| sc9_3_1\$1<br>sc9_3_1\$2<br>sc9_3_1\$3<br>sc9_3_1\$4<br>sc9_3_1\$5 | How many dairy cattle were affected by disease due to Cyclone Idai?<br>1 Bulls _____<br>2 Cows _____<br>3 Heifers _____<br>4 Female calves _____<br>5 Male calves _____                               | *Ask if sc9_3 = 1<br>*Enter -99 if do not know/refuse to answer<br>*Enter 0 if cattle type not affected by disease |               |
| sc9_3_2                                                            | Which diseases have your dairy cattle been affected by due to Cyclone Idai?<br>1 Foot and mouth disease<br>2 Mastitis<br>3 Lumpy skin disease<br>4 Other, specify<br>-99 Do not know/refuse to answer | *Select all that apply<br>*Ask if sc9_3 = 1                                                                        |               |
| sc9_4                                                              | How did your cow's milk production per day change as a result of Cyclone Idai, if at all?<br>1 Production per day decreased<br>2 Production per day remained same/no effect                           | *Select only one option                                                                                            |               |



|                |                                                                                                                                                                                                                           |                                                                                               |  |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--|
|                | 3 Production per day increased<br>-99 Do not know/refuse to answer                                                                                                                                                        |                                                                                               |  |
| <b>sc9_4_1</b> | By how many liters did the milk production change per day, per cow, on average?<br>_____                                                                                                                                  | *Ask if sc9_4 = 1 or sc9_4 = 3<br>*Enter -99 if do not know/refuse to answer                  |  |
| <b>sc9_5</b>   | Were any of the following items of your dairy business impacted by Cyclone Idai?<br>1 Dairy infrastructure<br>2 Feed supplies<br>3 Other, specify<br>-99 Do not know/refuse to answer                                     | *Select all that apply<br>*Read list for respondent                                           |  |
| <b>sc9_5_1</b> | What dairy infrastructure was impacted by Cyclone Idai?<br>1 Housing for dairy cattle<br>2 Water sources for dairy cattle<br>3 Milking equipment<br>4 Other, specify<br>-99 Do not know/refuse to answer                  | *Select all that apply<br>*Ask if sc9_5 = 1                                                   |  |
| <b>sc9_6</b>   | How has your access to dairy inputs changed as a result of Cyclone Idai, if at all?<br>1 More difficult to access inputs<br>2 Same/no effect<br>3 Easier to access inputs<br>-99 Do not know/refuse to answer             | *Select only one option                                                                       |  |
| <b>sc9_7</b>   | How has your ability to sell your milk changed as a result of Cyclone Idai, if at all?<br>1 More difficult to sell<br>2 Same/No effect<br>3 Easier to sell                                                                | *Select only one option                                                                       |  |
| <b>sc9_8</b>   | How has the average price of milk obtained from selling milk changed as a result of Cyclone Idai, if at all?<br>1 Average sale price is lower<br>2 Average sale price is same/No effect<br>3 Average sale price is higher | *Select only one option                                                                       |  |
| <b>sc9_8_1</b> | By how much did the average price change per liter of milk, on average?<br>_____                                                                                                                                          | *Ask if sc9_8=1 OR sc9_8=3<br>*Enter in Metical<br>*Enter -99 if do not know/refuse to answer |  |

|       |                                                                                                                                                                                                                                                                                                             |                         |  |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--|
| sc9_9 | <p>How has Cyclone Idai influenced your household's ability to access adequate food, if at all?</p> <p>1 Lowered access to or availability of food</p> <p>2 No effect on access to or availability of food</p> <p>3 Increased access to or availability of food</p> <p>-99 Do not know/refuse to answer</p> | *Select only one option |  |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--|

## SECTION 10: EXPERIENCE WITH MERCADO

**[Transition]:** Enumerator: Thank you! I want to ask you about how you think your dairying has changed based on your involvement in the MERCADO project.

| VARIABLES       | EFFECTS OF CYCLONE IDAI                                                                                                                                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                                                                                               | PMP INDICATOR |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>Sc10_3_1</b> | Based on your experience with MERCADO, how has your milk production per cow changed, if at all?<br>1 Increased<br>2 Stayed the same<br>3 Decreased<br>-99 Do not know/refuse to answer                                                                                           | *Ask if sc10_1 = 1<br>*Select only one option                                                                                         |               |
| <b>Sc10_3_2</b> | Based on your experience with MERCADO, how has your total income from dairy production changed, if at all?<br>1 Increased<br>2 Stayed the same<br>3 Decreased<br>-99 Do not know/refuse to answer                                                                                | *Select only one option                                                                                                               |               |
| <b>Sc10_3_3</b> | Based on your experience with MERCADO, how has your access to information changed, if at all?<br>1 Increased<br>2 Stayed the same<br>3 Decreased<br>-99 Do not know/refuse to answer                                                                                             | *Explain – information could mean information about market prices, information about diseases, inputs etc.<br>*Select only one option |               |
| <b>Sc10_3_4</b> | Based on your experience with MERCADO, how has your access to buyers changed, if at all?<br>1 Increased<br>2 Stayed the same<br>3 Decreased<br>-99 Do not know/refuse to answer                                                                                                  | *Select only one option                                                                                                               |               |
| <b>Sc10_3_5</b> | Based on your experience with MERCADO, how has your access to dairy inputs changed, if at all?<br>1 Increased<br>2 Stayed the same<br>3 Decreased<br>-99 Do not know/refuse to answer                                                                                            | *Select only one option<br>*Explain: dairy inputs can include food and feed supplements, medicines, veterinary care etc.              |               |
| <b>sc10_4_1</b> | Based on your experience with MERCADO, how has the way you house your cows changed, if at all?<br>1 Feeder/food receptacle in the kraal<br>2 Water cooler/water receptacle in the kraal<br>3 Sheet cover to give shade in the kraal<br>4 Cement in the milking area in the kraal | *Select all that apply<br>*If “6” or “-99” is selected make sure no other option is selected                                          |               |

|                 |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                             |  |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                 | 5 A dry ground in the kraal<br>6 Other, please specify<br>7 No change/stayed the same<br>-99 Do not know/refuse to answer                                                                                                                                                   |                                                                                                                                                                                             |  |
| <b>sc10_4_2</b> | Based on your experience with MERCADO, how has the way you breed your dairy cows changed?<br>1 Use artificial insemination more<br>2 Use natural breeding more<br>3 Other, please specify<br>4 No change/stayed the same<br>-99 Do not know/refuse to answer                | *Select only one option                                                                                                                                                                     |  |
| <b>sc10_4_3</b> | Based on your experience with MERCADO, how has the way you feed your cows changed?<br>1 Use zero grazing land more<br>2 Use supplements more<br>3 Use fodder/forage more<br>4 Other, please specify<br>5 No change/stayed the same<br>-99 Do not know/refuse to answer      | *Select all that apply<br>*If "4" or "-99" is selected make sure no other option is selected<br>*Explain: Improved feeding means use of zero grazing and use of supplements & fodder/forage |  |
| <b>sc10_4_4</b> | Based on your experience with MERCADO, how has your use of water changed?<br>1 Started providing cattle continuous access to water<br>2 Started bringing more water to cattle<br>3 Other, please specify<br>4 No change/stayed the same<br>-99 Do not know/refuse to answer | *Select all that apply<br>*If "3" or "-99" is selected make sure no other option is selected                                                                                                |  |
| <b>sc10_4_5</b> | Based on your experience with MERCADO, how has your use of animal health services changed?<br>1 Started weekly tick treatments<br>1 Started vaccinating cattle<br>2 No change/stayed the same<br>-99 Do not know/refuse to answer                                           | *Select only one option                                                                                                                                                                     |  |

## SECTION 11: CONCLUSION

**[Transition]:** Enumerator: Thank you for your responses up to now. We have a few remaining questions.

| VARIABLES                                                                                    | CONCLUSION                                                                                | ENUMERATOR INSTRUCTIONS                               | PMP INDICATOR |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------|
| <b>Sc11_1</b>                                                                                | Can we visit the Kraal?<br>1 Yes<br>2 No                                                  | *Select only one option<br>*If sc11_1=2, go to sc11_3 |               |
| <b>[Enumerator Instruction]: Ask sc11_2_1 to sc11_2_7 if sc11_1 = 1, else skip to sc11_3</b> |                                                                                           |                                                       |               |
| <b>Sc11_2_1</b>                                                                              | Accumulation of manure<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer               | *Select only one option                               |               |
| <b>Sc11_2_2</b>                                                                              | Existence of coverage<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                | *Select only one option                               |               |
| <b>Sc11_2_3</b>                                                                              | Ventilation<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                          | *Select only one option                               |               |
| <b>Sc11_2_4</b>                                                                              | Cement area in milking area<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer          | *Select only one option                               |               |
| <b>Sc11_2_5</b>                                                                              | Clean zone and freshwater ad libidum<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option                               |               |
| <b>Sc11_2_6</b>                                                                              | Existence of receptors for fodder<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer    | *Select only one option                               |               |
| <b>Sc11_2_7</b>                                                                              | Dry floor<br>1 Yes                                                                        | *Select only one option                               |               |

|               |                                                                                                                                                                                                                              |                         |  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--|
|               | 2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                     |                         |  |
| <b>Sc11_3</b> | It may be that in the coming days, you will receive a call to check out some of the answers you gave. This is part of our survey quality process. Are you willing to receive a short call for this purpose?<br>1 Yes<br>2 No | *Select only one option |  |

**[Transition]: Enumerator: Thank you!**

## MERCADO MIDTERM FARMER SURVEY (Portuguese Version)

### SECTION 0. BASIC INFORMATION

**[Enumerator Instruction]:** Please fill these questions prior to asking for consent from the respondent. *Instrução para o Entrevistador]: por favor, preencha estas perguntas antes de pedir o consentimento do entrevistado*

| VARIABLES                  | INTRODUCTION AND SURVEY ID                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                                                             | PMP INDICATOR |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------|
| sc0_1_1_LON<br>sc0_1_1_LAT | GPS coordinates <i>Coordenadas de GPS</i>                                                                                                                           |                                                                                                     |               |
| sc0_3_1                    | Province <i>Província</i><br>6 Manica<br>7 Sofala                                                                                                                   | *Select only one option <i>Selecione apenas uma opção</i>                                           |               |
| sc0_3_2                    | District <i>Distrito</i><br>61 Gondola<br>62 Macate<br>63 Sussundenga<br>64 Vanduzi                                                                                 | *Select only one option <i>Selecione apenas uma opção</i><br>*Ask if <i>Pergunte se</i> sc0_3_1 = 6 |               |
| sc0_3_3                    | Community <i>Comunidade</i><br>611 Amatongas Centro<br>612 Amatongas Socel<br>613 Bengo<br>614 Cafumpe<br>615 Francisco Manyanga<br>616 Ganhira<br>617 Gondola Sede | *Select only one option <i>Selecione apenas uma opção</i><br>*Ask if <i>Pergunte se</i> sc0_3_1 = 6 |               |

|               |                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                         |  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--|
|               | 618 Mafora<br>619 Mazicuera<br>6110 Mudima<br>6111 Zipinga<br>6129 Belas<br>6130 Chigodole<br>6131 Chimoio<br>6132 Chirimera<br>6133 Chitanaque<br>6134 Chitundo<br>6135 Cruzamento<br>6136 Macadeira<br>6137 Marera<br>6138 Matsinho<br>6139 Matsinho/Chirimera<br>6140 Nhademba<br>6141 Nhamakamba<br>6142 Sussundenga<br>6143 Vanduzi<br>6144 Zembe 1<br>6145 Zembe 4<br>98 Other |                                                                                                                         |  |
| sc0_3_3_OTHER | Other, please specify <b>Outro, por favor especifique</b>                                                                                                                                                                                                                                                                                                                            | *Ask if <b>Pergunte se</b><br>sc0_3_3 = 98                                                                              |  |
| sc0_3_3_1     | District <b>Distrito</b><br>71 Buzi<br>72 Caia<br>73 Chemba<br>74 Cheringoma<br>75 Chibabava<br>76 Dondo<br>77 Gorongosa                                                                                                                                                                                                                                                             | *Select only one<br>option <b>Selecione</b><br><b>apenas uma opção</b><br><br>*Ask if <b>pergunte se</b><br>sc0_3_1 = 7 |  |



|                 |                                                                                                                                                                                                                                                                                                                        |                                                                                                         |  |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--|
|                 | 78 Marromeu<br>79 Machanga<br>710 Maringue<br>711 Muanza                                                                                                                                                                                                                                                               |                                                                                                         |  |
| sc0_3_3_2       | Community/ <b>Comunidade</b><br>711 Nhangau<br>712 Manga - Mascarenha<br>713 N'dunda II<br>714 Canhandula<br>715 Inhamizua<br>716 Matadouro<br>717 Ceramica<br>718 Mandruzi<br>719 Nhamainga<br>7110 Balanca<br>7111 Macharote<br>7112 Consito<br>7113 Mafarinha<br>7114 Jasse – Estacao<br>7115 Metuchira<br>98 Other | *Select only one option <b>Selecione apenas uma opção</b><br><br>*Ask if <b>pergunte se</b> sc0_3_1 = 7 |  |
| sc0_3_3_2_OTHER | Other, please specify <b>Outro, por favor especifique</b>                                                                                                                                                                                                                                                              | *Ask if <b>pergunte se</b> sc0_3_3_2 = 98                                                               |  |
| sc0_3_4         | Respondent number (from list) <b>Número do entrevistado (da lista)</b>                                                                                                                                                                                                                                                 | *Enter from pre-populated list                                                                          |  |
| sc0_3_5         | Household head full name (from list) <b>Nome do chefe da familia (da lista)</b>                                                                                                                                                                                                                                        | *Enter from pre-populated list                                                                          |  |

**[Enumerator Instruction]:** Please read the informed consent script and obtain consent from respondent. *Por favor, leia o texto de consentimento informado e obtenha o consentimento do entrevistado.*

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| sc0_2_1 | <p><i>(Introduction)</i> Hello, my name is ____ and I am part of a team hired by Land O'Lakes to conduct a survey regarding dairy production. May I speak with one of the heads of household, preferably someone who has participated in dairy production on your farm?</p> <p><i>Present letter of introduction.</i></p> <p>With your permission, I would like to ask you questions about your household and your dairy activities. This will improve our understanding of dairy activities in the area and the households that work in dairy, helping Land O'Lakes to better support the sector. This study will be conducted with all dairy producers in the area supported by Land O'Lakes. Your answers will be kept confidential and will not be used for any purpose other than in a report that will help inform the dairy project being implemented by Land O' Lakes.</p> <p>The interview should last about an hour. Participation is voluntary and you can choose not to take part. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer. Land O'Lakes would like you to feel free to be open and honest in your responses. Knowing the true situation in your dairy production activities will help them provide better support to you in the future. There are no penalties to you for not participating or not answering a question. Neither your participation nor your responses will affect your ability to receive Land O'Lakes assistance now or in the future.</p> <p>Do you have any questions about any of the things I have just said?</p> |  |  |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  | <p>1 If yes → answer questions from respondent</p> <p>2 If no → continue to next question</p> <p><i>Introdução Olá meu nome é __ e faço parte de uma equipe contratada pela Land o ' Lakes para realizar uma pesquisa sobre produção de leite. Posso falar com um dos chefes de família, de preferência alguém que participou na produção de leite em sua fazenda?</i></p> <p><i>Apresente a carta de introdução.</i></p> <p><i>Com sua permissão, gostaria de lhe fazer perguntas sobre a sua casa e as suas atividades na produção de leite. Isto irá melhorar a nossa compreensão das atividades leiteiras na área e das famílias que trabalham com produção de leite, ajudando a Land o ' Lakes a apoiar melhor o setor. Este estudo será conduzido com todos os produtores de leite na área apoiada pelo Land o ' Lakes. Suas respostas serão mantidas confidenciais e não serão usadas para qualquer outro propósito que não seja em um relatório que ajudará a informar o projeto de leite que está sendo implementado pelo Land O ' Lakes.</i></p> <p><i>A entrevista deve durar cerca de uma hora. A participação é voluntária e você pode optar por não participar. Você também pode optar por se recusar a responder a quaisquer perguntas que você está desconfortável com ou não quer responder. Land o ' Lakes gostaria que você se sintisse livre para ser aberto e honesto em suas respostas. Conhecer a verdadeira situação das suas atividades de produção de leite irá ajudá-los a fornecer um melhor suporte para você no futuro. Não há penalidades para você por não participar ou não responder a uma pergunta. Nem a sua participação nem as suas respostas afetarão a sua capacidade de receber assistência Land o ' Lakes agora ou no futuro.</i></p> |  |  |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                           |  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--|
|         | <p><i>Tem alguma pergunta sobre as coisas que acabo de dizer?</i></p> <p><i>1 se Sim, responda as perguntas do entrevistado</i></p> <p><i>2 se não, continuar a próxima pergunta</i></p>                                                                                                                                                                                                                                                                                                                  |                                                           |  |
| sc0_2_2 | <p>Are you willing to participate in this interview? <b>Você está disposto a participar desta entrevista?</b></p> <p>1 Yes/sim</p> <p>2 No → <i>thank respondent for his/her time and conclude interview</i> <b>Não- agradecer o entrevistado pelo seu tempo e concluir a entrevista</b></p>                                                                                                                                                                                                              | *Select only one option                                   |  |
| sc0_4_1 | <p>Result of the survey: 1st attempt <b>Resultado da pesquisa: primeira tentativa</b></p> <p>6 Start of inquiry <b>Início do inquérito</b></p> <p>7 Interview declined / not granted <b>Entrevista recusada / não concedida</b></p> <p>8 The person being asked is not available <b>A pessoa solicitada não está disponível</b></p> <p>9 Requested additional information <b>Informações adicionais solicitadas</b></p> <p>10 Organized a new interview <b>organizou uma nova entrevista</b></p>          | *Select only one option                                   |  |
| sc0_4_2 | <p>Result of the survey: 2<sup>nd</sup> attempt <b>Resultado da pesquisa: segunda tentativa</b></p> <p>1 Start of inquiry <b>Início do inquérito</b></p> <p>2 Interview declined / not granted <b>Entrevista recusada / não concedida</b></p> <p>3 The person being asked is not available <b>A pessoa solicitada não está disponível</b></p> <p>4 Requested additional information <b>Informações adicionais solicitadas</b></p> <p>5 Organized a new interview <b>organizou uma nova entrevista</b></p> | *Select only one option <b>Selecione apenas uma opção</b> |  |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                  |  |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--|
| sc0_4_3 | <p>Result of the survey: 3<sup>rd</sup> attempt <b>Resultado da pesquisa: terceira tentativa</b></p> <ul style="list-style-type: none"> <li>1 Start of inquiry <b>Início do inquérito</b></li> <li>2 Interview declined / not granted <b>Entrevista recusada / não concedida</b></li> <li>3 The person being asked is not available <b>A pessoa solicitada não está disponível</b></li> <li>4 Requested additional information <b>Informações adicionais solicitadas</b></li> <li>5 Organized a new interview <b>organizou uma nova entrevista</b></li> </ul> | <p>*Select only one option <b>Selecione apenas uma opção</b></p> |  |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--|

## SECTION 1: HOUSEHOLD CHARACTERISTICS

**[Transition]:** Enumerator: Thank you for agreeing to participate in the survey. To begin, we will ask general questions about you and your household. Inqueridor: Obrigado por ter aceite participar na pesquisa. Para começar vamos fazer perguntas gerais sobre você e sua casa

| VARIABLES | HOUSEHOLD CHARACTERISTICS<br>(SOCIO-ECONOMIC PROFILE)                                                                                                                    | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PMP INDICATOR |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| sc1_1_0   | You are the representative of: <b>Você é o representante de</b><br>1 Household <b>Casa</b><br>2 An organization <b>Uma organização</b><br>3 A company <b>Uma empresa</b> | *Select only one option<br><b>Selecione apenas uma opção</b><br>*Explain: An organization could be larger farms, such as schools and orphanages operating dairy farm <b>Explique: Uma organização pode ser uma (machamba maior) fazendas maiores, como escolas e orfanatos que têm machambas de produção de leite</b> *Explain: A company refers to a commercially oriented farm enterprise <b>Explique: Uma empresa refere-se a uma empresa agrícola comercialmente orientada</b> |               |
| sc1_1_0_1 | Please specify name <b>Por favor, especifique o nome</b>                                                                                                                 | * Ask if <b>Pergunte se</b> sc1_1_0 = 2 OR sc1_1_0 = 3                                                                                                                                                                                                                                                                                                                                                                                                                             |               |

|               |                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                               |                                     |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| sc1_1_1       | Full name of respondent <b>nome completo do entrevistado</b>                                                                                                                                                                                                                                                                                                 |                                                                                                                                                               |                                     |
| sc0_3_5       | Contact information (cell phone) <b>Informação de contato (telefone celular)</b>                                                                                                                                                                                                                                                                             | Enter 10-digit number <b>Digite um número de 10 dígitos</b>                                                                                                   |                                     |
| sc1_1_2       | Gender of respondent <b>Sexo do entrevistado</b><br>1 Male <b>Masculino</b><br>2 Female <b>Feminino</b>                                                                                                                                                                                                                                                      | *Select only one option<br><b>Selecione apenas uma opção</b><br>*Do not ask, just enter<br><b>Não pergunte, apenas digite</b>                                 | INDICATORS:<br>#7 - #13; #16 - #18; |
| sc1_1_3       | Respondent's age in years <b>idade do entrevistado</b>                                                                                                                                                                                                                                                                                                       | *Enter in years<br><b>Inserir em anos</b><br>*Enter <b>Inserir</b> -99 if Do not know/refuse to answer age <b>Se não sabe / se recusa a responder a idade</b> |                                     |
| sc1_1_4       | Respondent's relationship to household head <b>Relação do entrevistado com o chefe da família</b><br>1 Self <b>próprio</b><br>2 Spouse <b>Esposo</b><br>3 Daughter <b>Filha</b><br>4 Son <b>Filho</b><br>5 Relative living in the house <b>Parente vivendo na casa</b><br>6 Farm labor/employee <b>trabalho agrícola / empregado</b><br>7 Other <b>Outro</b> | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                                  |                                     |
| sc1_1_4_other | Other, please specify <b>Outro, por favor especifique</b>                                                                                                                                                                                                                                                                                                    | *Ask if <b>Pergunte se</b> sc1_1_4 = 7                                                                                                                        |                                     |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                       |  |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| sc1_1_5 | <p>(Respondent's educational background) Highest level of schooling completed <b>Escolaridade do entrevistado) Nível mais alto de escolaridade completado</b></p> <p>1 Primary of first grade (1st - 5th class) <b>Primária do primeiro grau (1ª a 5ª classe)</b></p> <p>2 Primary of the second degree (6th - 7th class) <b>Primária do segundo grau (6ª a 7ª classe)</b></p> <p>3 Secondary of the first grade (8th-10th class) <b>Secundária do primeiro grau (8ª-10ª classe)</b></p> <p>4 Secondary school (11th-12th class) <b>Escola Secundária (11ª a 12ª)</b></p> <p>5 Technical-Professional <b>Técnico-Profissional</b></p> <p>6 University and postgraduate studies <b>Universidade e pós-graduação</b></p> <p>7 Did not complete any degree but went to school <b>Não completou nenhum grau, mas foi para a escola</b></p> <p>8 No schooling <b>Sem escolaridade</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p> | <p>*Select only one option <b>Selecione apenas uma opção</b></p> <p>*Explain: did not complete any degree implies the person went to post-graduate studies/university but did not finish them. <b>Explique: não completou nenhum grau implica que a pessoa foi para estudos de pós-graduação / universidade, mas não terminou</b></p> |  |
| sc1_2_1 | <p>How many people usually live in this household including yourself and any visitors residing for 6 or more months? <b>Quantas pessoas geralmente vivem nesta casa, incluindo a si mesmo e todos os visitantes que residem por 6 meses ou mais?</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>*Ensure that the respondent includes himself/herself and any child who has not yet been registered <b>Certifique-se que o entrevistado se inclui / ela mesma e qualquer criança que ainda não foi registrado</b></p> <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe / recusa a responder</b></p>          |  |



|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                               |  |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--|
| sc1_3_1 | <p>What is the main material of the floor of the residence (excluding kitchen and bathrooms)? Qual é o material principal do chão da residência (excluindo cozinha e casa de banho)?</p> <p>1 With nothing, or other materials not mentioned below Com nada, ou outros materiais não mencionados abaixo</p> <p>2 Adobe (matope), wood/parquet, marble/granite, cement, or mosaic/tile tijolo cru (matope), madeira / parquet, mármore / granito, cimento ou mosaico / telha</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                             | <p>*Select only one option<br/>Selecione apenas uma opção</p> |  |
| sc1_3_2 | <p>What is the main material of the walls of the residence? Qual é o material principal das paredes da residência?</p> <p>1 Cane/sticks/bamboo/palm tree, wood/zinc, tin/ cardboard/paper/ba /shell, other Cana / varas / bambu / palmeira, madeira / zinco, estanho / papelão / papel / ba / casca, outros</p> <p>2 Block of adobe/raw blocks, staked sticks (stick to pike) Bloco de tijolo / tijolo cru, varas empilhadas (pau e pique)</p> <p>3 Block of cement or brick Bloco de cimento ou tijolo</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p> | <p>*Select only one option<br/>Selecione apenas uma opção</p> |  |
| sc1_3_3 | <p>What toilet arrangement does the household use in its residence? Que arranjo de casa de banho o agregado familiar usa em sua residência?</p> <p>4 None or other (facilities not mentioned) Nenhum ou outro (instalações não mencionadas)</p> <p>5 Latrine (of any type) Latrina (de qualquer tipo)</p>                                                                                                                                                                                                                                                                            | <p>*Select only one option<br/>Selecione apenas uma opção</p> |  |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                 |  |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--|
|               | <p>6 Toilet connected to the septic tank WC ligado ao tanque séptico</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                                                                                                                                                                                 |                                                                 |  |
| sc1_3_4       | <p>What is the main source of energy for lighting in the residence? Qual é a principal fonte de energia para iluminação na residência?</p> <p>1 Firewood, or batteries lenha ou baterias</p> <p>2 LPG, oil/paraffin/kerosene, or candles GLP (petróleo liquefeito), óleo / parafina / querosene ou velas</p> <p>3 Electricity, generator, or solar panel Eletricidade, gerador ou painel solar</p> <p>4 Other Outros</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p> | <p>*Select all that apply<br/>Selecione tudo que se aplica</p>  |  |
| sc1_3_4_other | <p>Other, please specify Outro (por favor, especifique</p>                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>*Ask if sc1_3_4 = 4</p>                                      |  |
| sc1_3_5       | <p>Does the household have a non-electric or electric clothes iron? O agregado familiar tem um ferro de passar roupa não elétrico ou elétrico?</p> <p>2 Yes Sim</p> <p>3 No Não</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                                                                      | <p>*Select only one option<br/>Selecione tudo que se aplica</p> |  |
| sc1_3_6       | <p>Does the household have a clock (wall, wrist or pocket)? O agregado familiar tem um relógio (parede, pulso ou bolso)?</p> <p>1 Yes Sim</p> <p>2 No Não</p>                                                                                                                                                                                                                                                                                                                                     | <p>*Select only one option<br/>Selecione tudo que se aplica</p> |  |

|                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |  |
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|                                                                                                                                                            | -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                                 |                                                                                     |  |
| sc1_3_7                                                                                                                                                    | Does the household have a radio, stereo system, or cassette player? <b>O agregado familiar tem um rádio, aparelhagem estéreo ou leitor de cassetes?</b><br>1 No <b>Não</b><br>2 Radio only <b>apenas rádio</b><br>3 Stereo system or cassette player (regardless of radio) <b>Sistema estéreo ou toca-fitas (independentemente do rádio)</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione tudo que se aplica</b>                      |  |
| <b>[Transition]</b> Enumerator: Now we will ask about your household's sources of income <b>Agora vamos perguntar sobre as fontes de renda de sua casa</b> |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |  |
| sc1_5_1_0                                                                                                                                                  | Does your household currently obtain any income? <b>O seu agregado familiar atualmente obtém algum rendimento?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                    | *Select only one option<br><b>Selecione apenas uma opção</b>                        |  |
|                                                                                                                                                            | Which of the following activities does your household obtain income from? <b>De quais das seguintes atividades seu agregado recebe rendimento?</b>                                                                                                                                                                                                                                                                       | *Ask questions <b>Pergunte</b><br>sc1_5_1_1 - sc1_5_1_11<br>_other if sc1_5_1_0 = 1 |  |
| sc1_5_1_1                                                                                                                                                  | Dairy farming <b>produção leiteira.</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                                                                                                                                                                                                                           | *Select only one option<br><b>Selecione apenas uma opção</b>                        |  |

|           |                                                                                                                                                                                                      |                                                       |  |
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|           | -99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                                                                                    |                                                       |  |
| sc1_5_1_2 | Other livestock/beef fattening, rearing livestock Outros animais / engorda de bovinos, criação de gado<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_3 | Crop production produção agrícola<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                      | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_4 | Fisheries Pescas<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                                       | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_5 | Government employment Funcionário do Estado<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                            | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_6 | Private sector employment Emprego no setor privado<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                     | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_7 | Daily labor Trabalho diário<br>1 Yes Sim<br>2 No Não                                                                                                                                                 | *Select only one option<br>Selecione apenas uma opção |  |

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|                                                                                                                                                                                                                                                                     | -99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                     |                                                       |  |
| sc1_5_1_8                                                                                                                                                                                                                                                           | Trader/shopkeeper Comerciante / lojista<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_9                                                                                                                                                                                                                                                           | Social support Assistência Social<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder       | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_10                                                                                                                                                                                                                                                          | Forest products Produtos florestais<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder     | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_11                                                                                                                                                                                                                                                          | Other Outros<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                            | *Select only one option<br>Selecione apenas uma opção |  |
| sc1_5_1_11_other                                                                                                                                                                                                                                                    | Other, please specify Outro, por favor especifique                                                                                    | *Ask if Pergunte se<br>sc1_5_1_11 = 1                 |  |
| [Enumerator Instruction] : Now, from the income sources selected, please rank the top 5 on order of importance in income earned Agora, a partir das fontes de renda selecionadas, por favor, classifique os 5 primeiros em ordem de importância no rendimento ganho |                                                                                                                                       |                                                       |  |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                         |  |
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| sc1_5_2_1 | <p>Most important (1) <b>Mais importante (1)</b></p> <p>1 Dairy farming <b>produção leiteira</b></p> <p>2 Other livestock/beef fattening, rearing livestock <b>Outros animais / engorda de bovinos, criação de gado</b></p> <p>3 Crop production <b>produção agrícola</b></p> <p>4 Fisheries <b>Pescas</b></p> <p>5 Government employment <b>Funcionário do Estado</b></p> <p>6 Private sector employment <b>Emprego no setor privado</b></p> <p>7 Daily labor <b>Trabalho diário</b></p> <p>8 Trader/shopkeeper <b>Comerciante / lojista</b></p> <p>9 Social support <b>Assistência Social</b></p> <p>10 Forest products <b>Produtos florestais</b></p> <p>98 Other <b>Outros</b></p>                                                                                  | <p>*Select only one option</p> <p><b>Selecione apenas uma opção</b></p> |  |
| sc1_5_2_2 | <p>Which was the second most important income source? (2) <b>Qual foi a segunda fonte de renda mais importante?</b></p> <p>1 Dairy farming <b>produção leiteira</b></p> <p>2 Other livestock/beef fattening, rearing livestock <b>Outros animais / engorda de bovinos, criação de gado</b></p> <p>3 Crop production <b>produção agrícola</b></p> <p>4 Fisheries <b>Pescas</b></p> <p>5 Government employment <b>Funcionário do Estado</b></p> <p>6 Private sector employment <b>Emprego no setor privado</b></p> <p>7 Daily labor <b>Trabalho diário</b></p> <p>8 Trader/shopkeeper <b>Comerciante / lojista</b></p> <p>9 Social support <b>Assistência Social</b></p> <p>10 Forest products <b>Produtos florestais</b></p> <p>11 N/A</p> <p>98 Other <b>Outros</b></p> | <p>*Select only one option</p>                                          |  |
| sc1_5_2_3 | <p>Which was the third most important income source? (3) <b>Qual foi a terceira fonte de renda mais importante?</b></p> <p>1 Dairy farming <b>produção leiteira</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>*Select only one option</p>                                          |  |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                         |  |
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|           | 2 Other livestock/beef fattening, rearing livestock<br>Outros animais / engorda de bovinos, criação de gado<br>3 Crop production produção agrícola<br>4 Fisheries Pescas<br>5 Government employment Funcionário do Estado<br>6 Private sector employment Emprego no setor privado<br>7 Daily labor Trabalho diário<br>8 Trader/shopkeeper Comerciante / lojista<br>9 Social support Assistência Social<br>10 Forest products Produtos florestais<br>11 N/A<br>98 Other Outros                                                                                                                                                     |                         |  |
| sc1_5_2_4 | Which was the fourth most important income source? (4)<br>Qual foi a quarta fonte de renda mais importante?<br>1 Dairy farming produção leiteira<br>2 Other livestock/beef fattening, rearing livestock<br>Outros animais / engorda de bovinos, criação de gado<br>3 Crop production produção agrícola<br>4 Fisheries Pescas<br>5 Government employment Funcionário do Estado<br>6 Private sector employment Emprego no setor privado<br>7 Daily labor Trabalho diário<br>8 Trader/shopkeeper Comerciante / lojista<br>9 Social support Assistência Social<br>10 Forest products Produtos florestais<br>11 N/A<br>98 Other Outros | *Select only one option |  |
| sc1_6_2_5 | Which was the fifth most important income source? (5)<br>Qual foi a quinta fonte de renda mais importante?<br>1 Dairy farming produção leiteira<br>2 Other livestock/beef fattening, rearing livestock<br>Outros animais / engorda de bovinos, criação de gado                                                                                                                                                                                                                                                                                                                                                                    | *Select only one option |  |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |  |
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|         | 3 Crop production <b>produção agrícola</b><br>4 Fisheries <b>Pescas</b><br>5 Government employment <b>Funcionário do Estado</b><br>6 Private sector employment <b>Emprego no setor privado</b><br>7 Daily labor <b>Trabalho diário</b><br>8 Trader/shopkeeper <b>Comerciante / lojista</b><br>9 Social support <b>Assistência Social</b><br>10 Forest products <b>Produtos florestais</b><br>11 N/A<br>98 Other <b>Outros</b>                                                                                                                                    |                                                                                                                                                                       |  |
| sc1_6_3 | Were there any months in the past twelve months (July 1, 2018 – June 30, 2019), that your family did not have enough to eat? <b>Houve algum mês nos últimos doze meses (1º de julho de 2018 - 30 de junho de 2019), que sua família não teve o suficiente para comer?</b><br>3 Yes <b>Sim</b><br>4 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                     | *Select only one option                                                                                                                                               |  |
| sc1_6_5 | In which months in the past twelve months (July 1, 2018 – June 30, 2019) did your household NOT have enough to eat? <b>Em que meses nos últimos doze meses (1º de julho de 2018 - 30 de junho de 2019) sua casa NÃO teve o suficiente para comer?</b><br>1 July, 2018 <b>Julho/18</b><br>2 August, 2018 <b>Agosto/18</b><br>3 September, 2018 <b>Setembro/18</b><br>4 October, 2018 <b>Outubro/18</b><br>5 November, 2018 <b>Novembro/18</b><br>6 December, 2018 <b>Dezembro/18</b><br>7 January, 2019 <b>Janeiro/19</b><br>8 February, 2019 <b>Fevereiro/19</b> | *Ask if sc1_6_3 = 1<br>*Select only one option<br><b>Selecione apenas uma opção</b><br>*If exhausted reserves more than once, select the last time exhausted reserves |  |



|         |                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                    |  |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|         | 9 March, 2019 <b>Março/19</b><br>10 April, 2019 <b>Abril/19</b><br>11 May, 2019 <b>Maio/19</b><br>12 June, 2019 <b>Junho/19</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> |                                                                                                                                                                                                                                                                    |  |
| sc1_6_6 | Currently, how many meals do you eat per day?<br><b>Atualmente, quantas refeições você come por dia?</b>                                                                                                    | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Explain: Meal is defined as portion of food to satisfy one's appetite <b>Explique: Refeição é definida como porção de comida para satisfazer o apetite</b> |  |

## **SECTION 2: CURRENT DAIRY PRODUCTION**

**[Transition]:** *Enumerator: Great! Now I would like to ask you about your cattle and current dairy production. Agora gostaria de perguntar sobre suas vacas e a atual produção de leite .*

| VARIABLES | CURRENT DAIRY PRODUCTION                                                                                                                                                                                                       | ENUMERATOR INSTRUCTIONS                                      | PMP INDICATOR                                      |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|
| sc2_1     | Do you or anyone in your household currently own, or have you ever owned, any dairy cows? <b>Você ou alguém em sua casa possui atualmente, ou já possuiu, alguma vaca leiteira?</b><br>1 Yes, currently <b>Sim, atualmente</b> | *Select only one option<br><b>Selecione apenas uma opção</b> | INDICATORS:<br>#1; #2; #7 - #13;<br>#15 - #18; #24 |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                         |  |
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|          | <p>2 Currently no, but previously did → Thank respondent and conclude interview. 2 <b>Atualmente não, mas anteriormente tinha</b> ☑ <b>Agradecer o entrevistado e concluir entrevista.</b></p> <p>3 Never owned → Thank respondent and conclude interview. <b>Nunca possuiu</b> ☑ <b>Agradecer ao entrevistado e concluir a entrevista.</b></p> <p>-99 Do not know/refuse to answer → Thank respondent and conclude interview <b>Não sei / recuso-me a responder</b> ☑ <b>Agradecer ao entrevistado e concluir a entrevista</b></p> |                                                                                                                                                                                                                         |  |
| sc2_2    | In what year did you begin dairy farming? <b>Em que ano você começou a produção leiteira</b>                                                                                                                                                                                                                                                                                                                                                                                                                                        | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b>                                                                                                                     |  |
| sc2_3    | What was the maximum number of dairy cattle that you have ever owned? <b>Qual foi o número máximo de gado leiteiro que você já possuiu</b>                                                                                                                                                                                                                                                                                                                                                                                          | <p>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b></p> <p>*Enter number&gt;0 <b>Digite o número 0</b></p> <p>*Enter 0 if not owned <b>Digite 0 se não tiver</b></p> |  |
| s2_6_1_1 | How many pure dairy breed bulls does your household currently have / raise? <b>Quantos touros puros de racas leiteiras sua familia atualmente tem / cria?</b>                                                                                                                                                                                                                                                                                                                                                                       | <p>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b></p> <p>*Enter 0 if not owned <b>Digite 0 se não tiver</b></p>                                                    |  |

|          |                                                                                                                                                                      |                                                                                                                                                            |                                                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| s2_6_2_1 | How many crossbreed bulls does your household currently have/raise? <b>Quantos touros cruzados a sua familia tem atualmente / cria?</b>                              | * Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b> |                                                |
| s2_6_3_1 | How many total bulls does your household currently have / raise? <b>Qual é o numero total de touros que a sua familia tem atualmente / cria?</b>                     | Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b>   |                                                |
| s2_6_1_2 | How many pure dairy breed cows does your household currently have / raise? <b>Quantas vacas de raça pura leiteira o seu agregado familiar tem atualmente / cria?</b> | * Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b> |                                                |
| s2_6_2_2 | How many crossbreed cows does your household currently have / raise? <b>Quantas vacas cruzadas seu agregado tem atualmente / cria?</b>                               | Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b>   |                                                |
| s2_6_3_2 | How many total cows does your household currently have / raise? <b>Qual é o numero total de vacas, a sua familia tem atualmente / cria?</b>                          | * Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b> | INDICATORS:<br>#1; #2; #7-#13;<br>#15-#18; #24 |

|          |                                                                                                                                                                     |                                                                                                                                                            |  |
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| s2_6_1_4 | How many pure dairy breed heifers does your household currently have / raise? <b>Quantas novilhas de raça pura leiteira sua familia tem / cria?</b>                 | Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b>   |  |
| s2_6_2_4 | How many crossbreed heifers does your household currently have / raise? <b>Quantas novilhas cruzadas a sua familia tem atualmente / cria?</b>                       | * Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b> |  |
| s2_6_3_4 | How many total heifers does your household currently have / raise? <b>Qual é o numero total de novilhas que a sua familia tem atualmente / cria?</b>                | Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b>   |  |
| s2_6_1_7 | How many pure dairy breed female calves does your household currently have / raise? <b>Quantos filhotes fêmeas de raça leiteira sua casa atualmente tem / cria?</b> | * Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b> |  |
| s2_6_2_7 | How many crossbreed female calves does your household currently have / raise? <b>Quantas vitelas cruzadas a sua familia tem atualmente / cria?</b>                  | Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder</b><br>*Enter 0 if not owned <b>Digite 0 se não tiver</b>   |  |

|          |                                                                                                                                                                                                                                                                                                                |                                                                                                                                              |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--|
| s2_6_3_7 | How many total female calves does your household currently have / raise? Qual e o numero total de vitelas (fêmeas) a sua familia tem atualmente / cria?                                                                                                                                                        | Enter -99 if Do not know/refuse to answer Digite -99 se não souber / se recusar a responder<br>*Enter 0 if not owned Digite 0 se não tiver   |  |
| s2_6_1_8 | How many pure dairy breed male calves does your household currently have / raise? Quantos vitelos (machos) da raça leiteira pura o seu agregado familiar atualmente tem / cria?                                                                                                                                | * Enter -99 if Do not know/refuse to answer Digite -99 se não souber / se recusar a responder<br>*Enter 0 if not owned Digite 0 se não tiver |  |
| s2_6_2_8 | How many crossbreed male calves does your household currently have / raise? Quantas vitelos cruzados (machos) é que o seu agregado familiar tem atualmente / cria?                                                                                                                                             | * Enter -99 if Do not know/refuse to answer Digite -99 se não souber / se recusar a responder<br>*Enter 0 if not owned Digite 0 se não tiver |  |
| s2_6_3_8 | How many total male calves does your household currently have / raise? Qual e o numero total de vitelos (machos) a sua familia tem atualmente / cria?                                                                                                                                                          | * Enter -99 if Do not know/refuse to answer Digite -99 se não souber / se recusar a responder<br>*Enter 0 if not owned Digite 0 se não tiver |  |
|          | Now please tell me about the cows in your herd – if you have more than 3 cows in your herd, please tell me about only 4 cows of your choice<br>Agora, por favor, me fale sobre as vacas em seu rebanho - se você tiver mais de 3 vacas no seu rebanho, por favor me conte sobre apenas 4 vacas de sua escolha. | *Ask if s2_6_3_2<=10 else skip to sc2_10_RECORD                                                                                              |  |

|                                                                                  |                                                                                                                                                                                                                                                                     |                                                                                                                                         |  |
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|                                                                                  | For each cow please answer the following : <b>Para cada vaca por favor responda o seguinte</b>                                                                                                                                                                      |                                                                                                                                         |  |
| NOME_DA_VACA\$1<br>NOME_DA_VACA\$2<br>NOME_DA_VACA\$3<br>NOME_DA_VACA\$4         | Name <b>Nome</b>                                                                                                                                                                                                                                                    | *Enter -99 if cow does not have a name                                                                                                  |  |
| SC2_7_0_RECORD\$1<br>SC2_7_0_RECORD\$2<br>SC2_7_0_RECORD\$3<br>SC2_7_0_RECORD\$4 | Do you have a recordbook for this cow ? <b>Você tem um livro de registros para esta vaca ?</b><br>3 Yes<br>4 No<br>-99 Do not know/refuse to answer 99 <b>Não sabe / recusa-se a responder</b>                                                                      | *Select only one option                                                                                                                 |  |
| SC2_7_1\$1<br>SC2_7_1\$2<br>SC2_7_1\$3<br>SC2_7_1\$4                             | Does the record book have information if the cow is purebred dairy or crossbred ? <b>O livro de registro tem informações sobre se a vaca é de raça pura ou cruzada</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option                                                                                                                 |  |
| SC2_7_2_RECORD\$1<br>SC2_7_2_RECORD\$2<br>SC2_7_2_RECORD\$3<br>SC2_7_2_RECORD\$4 | Is this cow purebred dairy or crossbred ? <b>Esta vaca é de raça leiteira pura ou cruzada?</b><br>3 Purebred dairy <b>raça pura leiteira</b><br>4 Crossbred <b>cruzada</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>              | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1<br><br>*Select only one option |  |

**[Enumerator Instruction]:** If sc2\_7\_2\_RECORD\$1 – sc2\_7\_2\_RECORD\$4 = 1, then for questions sc2\_7\_2\_MONTH\$1 – sc2\_7\_2\_MONTH\$4 and sc2\_7\_2\_MES\$1 – sc2\_7\_2\_MES\$4, fill out from the record book; else ask only the date and fill out yourself.

For example, if they say « January 1, 2019 », then fill « 1 » for the month ; and « 2019 » for the year Por exemplo, se ele diz « Janeiro 1, 2019 », então preencha « 1 » para o mês ; e « 2019 » para o ano

|                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                              |                                     |
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| sc2_7_2_MONTH\$1<br>sc2_7_2_MONTH\$2<br>sc2_7_2_MONTH\$3<br>sc2_7_2_MONTH\$4 | When was the first time she gave birth (while she was under your responsibility)? Please give me the date<br>Quando foi a primeira vez que a vaca pariu (enquanto ela estava sob sua responsabilidade)? Por favor indique a data<br>1 January Janeiro<br>2 February Fevereiro<br>3 March Março<br>4 April Abril<br>5 May Maio<br>6 June Junho<br>7 July Julho<br>8 August Agosto<br>9 September Setembro<br>10 October Outubro<br>11 November Novembro<br>12 December Dezembro<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder | *Select only one option <b>Selecione apenas uma opção</b><br>*Ask only the date and fill this out yourself <b>Peça apenas a data e preencha pessoalmente</b> | INDICATOR: #9<br><b>Indicadores</b> |
| sc2_7_2_MES\$1<br>sc2_7_2_MES\$2<br>sc2_7_2_MES\$3<br>sc2_7_2_MES\$4         | Year/ <b>Ano</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | *Ask only the date and fill this out yourself<br>*Enter -99 if Do not know/refuse to answer                                                                  | INDICATOR: #9                       |

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| sc2_7_3_RECORD\$1<br>sc2_7_3_RECORD\$2<br>sc2_7_3_RECORD\$3<br>sc2_7_3_RECORD\$4                                                                                                                                                                                                                                                                                                                                                            | Does the record book have information on how many times the cow has been pregnant ? <b>livro de registro contém informações sobre quantas vezes a vaca esteve grávida?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>      | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1<br>*Select only one option                                                                                                                 |               |
| sc2_7_3\$1<br>sc2_7_3\$2<br>sc2_7_3\$3<br>sc2_7_3\$4                                                                                                                                                                                                                                                                                                                                                                                        | How many times has she been pregnant (while under your responsibility)? <b>Quantas vezes ela esteve grávida (sob sua responsabilidade) ?</b>                                                                                                                                                       | *If SC2_7_3_RECORD\$1 = 1 OR SC2_7_3_RECORD\$2 = 1 OR SC2_7_3_RECORD\$3 = 1 OR SC2_7_3_RECORD\$4 = 1 then fill from record book ; else ask the répondent and fill yourself<br>*Select only one option<br>*Enter -99 if Do not know/refuse to answer | INDICATOR: #9 |
| sc2_7_4_RECORD\$1<br>sc2_7_4_RECORD\$2<br>sc2_7_4_RECORD\$3<br>sc2_7_4_RECORD\$4                                                                                                                                                                                                                                                                                                                                                            | Does the record book have information on when the cow last calved? ? <b>Será que o livro de registro tem informações sobre quando é que foi a última vez que a vaca pariu ?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1<br>*Select only one option                                                                                                                 |               |
| <p><b>[Enumerator Instruction]</b> : If sc2_7_4_RECORD\$1 – sc2_7_4_RECORD\$4 = 1, then for questions sc2_7_4_DAY\$1 – sc2_7_4_DAYS\$4, sc2_7_4_MONTH\$1 – sc2_7_4_MONTH\$4 and sc2_7_4_YEAR\$1 – sc2_7_4_YEAR\$4, fill out from record book; else ask only the date and fill out yourself.</p> <p><b>For example, if the respondent says « January 1, 2019 » then fill out « 1 » for day, « 1 » for January, and « 2019 » for year</b></p> |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                     |               |



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| sc2_7_4_DAY\$1<br>sc2_7_4_DAY\$2<br>sc2_7_4_DAY\$3<br>sc2_7_4_DAY\$4          | When did she last calve <b>Quando foi a ultima vez que a vaca pariu ? Dia</b>                                                                                                                                                                                                                                                                                                                                                  | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b><br>*Enter number between 1 – 31 <b>Digite um número entre 1 e 31</b> | INDICATOR: #8 |
| sc2_7_4_MONTH\$1<br>sc2_7_4_MONTH\$2<br>sc2_7_4_MONTH\$13<br>sc2_7_4_MONTH\$4 | Month <b>Mês</b><br>1 January <b>Janeiro</b><br>2 February <b>Fevereiro</b><br>3 March <b>Março</b><br>4 April <b>Abril</b><br>5 May <b>Maio</b><br>6 June <b>Junho</b><br>7 July <b>Julho</b><br>8 August <b>Agosto</b><br>9 September <b>Setembro</b><br>10 October <b>Outubro</b><br>11 November <b>Novembro</b><br>12 December <b>Dezembro</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option <b>Selecione apenas uma opção</b>                                                                                                              | INDICATOR: #8 |
| sc2_7_4_YEAR\$1<br>sc2_7_4_YEAR\$2<br>sc2_7_4_YEAR\$3<br>sc2_7_4_YEAR\$4      | Year <b>Ano</b>                                                                                                                                                                                                                                                                                                                                                                                                                | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b>                                                                      | INDICATOR: #8 |
| sc2_58\$1<br>sc2_58\$2<br>sc2_58\$3<br>sc2_58\$4                              | Is she currently producing milk ? A vaca <b>está atualmente a produzir leite?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                           | *Select only one option <b>Selecione apenas uma opção</b>                                                                                                              | INDICATOR: #8 |

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| sc2_58_1_RECORD\$1<br>sc2_58_1_RECORD\$2<br>sc2_58_1_RECORD\$3<br>sc2_58_1_RECORD\$4 | Does the record book have information on how much milk she produced yesterday ? (morning and evening combined) <b>O livro de registro contém informações sobre quanto leite ela produziu ontem? (manhã e noite somado )</b><br><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>3 -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                          | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1<br>*Select only one option                                                                                                                                                                                                                                                 |  |
| sc2_58_1\$1<br>sc2_58_1\$2<br>sc2_58_1\$3<br>sc2_58_1\$4                             | How much milk did she produce yesterday (morning and evening combined) ? <b>Quanto leite ela produziu ontem ( de manhã e anoite somado )?</b>                                                                                                                                                                                                                                                                 | *Enter in liters <b>Digite em litros</b><br>*Enter -99 if Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b><br>*If sc2_58_1_RECORD\$1 = 1 OR sc2_58_1_RECORD\$2 = 1 OR sc2_58_1_RECORD\$3 = 1 OR sc2_58_1_RECORD\$4 = 1 then fill from record book, else ask respondent and fill out <b>depois preencha o livro de registro, peça ao entrevistado e preencha</b> |  |
| sc2_58_2_RECORD\$1<br>sc2_58_2_RECORD\$2<br>sc2_58_2_RECORD\$3<br>sc2_58_2_RECORD\$4 | Does the record book have information on how much milk she produced at her peak production (morning and evening) during this lactation? <b>O livro de registro contém informações sobre quanto leite ela produziu no seu pico de produção (manhã e noite) durante esta lactação?</b><br><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>3 -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1<br>*Select only one option                                                                                                                                                                                                                                                 |  |

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| sc2_58_2\$1<br>sc2_58_2\$2<br>sc2_58_2\$3<br>sc2_58_2\$4                                                                                                                                                                                                                                                                                                                                                                       | How much milk did she produce at her peak production (morning and evening) during this lactation ? <b>Quanto leite ela produz no seu pico de produção (manhã e noite) durante esta lactação?</b>                                                                                                | *Enter in liters <b>Digite em litros</b><br>*Enter -99 if Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b><br>*If sc2_58_1_RECORD\$1 = 1 OR<br>sc2_58_1_RECORD\$2 = 1 OR<br>sc2_58_1_RECORD\$3 = 1 OR<br>sc2_58_1_RECORD\$4 = 1 then fill from record book, else ask respondent and fill out <b>depois preencha o livro de registro, peça ao entrevistado e preencha</b> |               |
| sc2_5_8_RECORD\$1<br>sc2_5_8_RECORD\$2<br>sc2_5_8_RECORD\$3<br>sc2_5_8_RECORD\$4                                                                                                                                                                                                                                                                                                                                               | Does the record book have information on when she stopped producing milk? <b>O livro de registro contém informações sobre quando ela parou (ou secou) de produzir leite?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if sc2_58\$1=2 OR -99 ;<br>sc2_58\$2=2 OR -99 ;<br>sc2_58\$3=2 OR -99 ;<br>sc2_58\$4=2 OR -99 ;<br>*Select only one option                                                                                                                                                                                                                                                              |               |
| <p><b>[Enumerator Instruction]:</b> If sc2_5_8_RECORD\$1 – sc2_5_8_RECORD\$4 = 1, then for questions sc2_5_8_DAY\$1 – sc2_5_8_DAY\$4 ; sc2_5_8_MONTH\$1 – sc2_5_8_MONTH\$4 ; and sc2_5_8_YEAR\$1 – sc2_5_8_YEAR\$4, fill out from record book ; else ask only the date and fill out yourself.</p> <p><b>For example, if they say « January 1, 2019 », fill out « 1 » for day ; « 1 » for month ; and « 2019 » for year</b></p> |                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                              |               |
| sc2_5_8_DAY\$1<br>sc2_5_8_DAY\$2<br>sc2_5_8_DAY\$3<br>sc2_5_8_DAY\$4                                                                                                                                                                                                                                                                                                                                                           | When did she stop producing milk ? <b>Quando ela parou de produzir leite (ou secou)</b><br>Day <b>Dia</b>                                                                                                                                                                                       | *Ask if <b>Pergunte se</b><br>sc2_58\$1 = 2 OR<br>sc2_58\$2 = 2 OR<br>sc2_58\$3 = 2 OR<br>sc2_58\$4 = 2                                                                                                                                                                                                                                                                                      | INDICATOR: #8 |

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|                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>*Enter number between 1 – 31<br/> <b>Digite um número entre 1 e 31</b><br/>         *Enter -99 if Do not know/refuse to answer answer <b>Digite -99 se não sabe ou se recusa a responder</b></p>                                          |               |
| <b>sc2_5_8_MONTH\$1</b><br><b>sc2_5_8_MONTH\$2</b><br><b>sc2_5_8_MONTH\$3</b><br><b>sc2_5_8_MONTH\$4</b> | <p>Month <b>Mês</b></p> <p>1 January <b>Janeiro</b></p> <p>2 February <b>Fevereiro</b></p> <p>3 March <b>Março</b></p> <p>4 April <b>Abril</b></p> <p>5 May <b>Maio</b></p> <p>6 June <b>Junho</b></p> <p>7 July <b>Julho</b></p> <p>8 August <b>Agosto</b></p> <p>9 September <b>Setembro</b></p> <p>10 October <b>Outubro</b></p> <p>11 November <b>Novembro</b></p> <p>12 December <b>Dezembro</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p> | <p>*Ask if<br/>         sc2_58\$1 = 2 OR<br/>         sc2_58\$2 = 2 OR<br/>         sc2_58\$3 = 2 OR<br/>         sc2_58\$4 = 2</p> <p>*Select only one option<br/> <b>Selecione apenas uma opção</b></p>                                    | INDICATOR: #8 |
| <b>sc2_5_8_YEAR\$1</b><br><b>sc2_5_8_YEAR\$2</b><br><b>sc2_5_8_YEAR\$3</b><br><b>sc2_5_8_YEAR\$4</b>     | <p>Year <b>Ano</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>*Ask if<br/>         sc2_58\$1 = 2 OR<br/>         sc2_58\$2 = 2 OR<br/>         sc2_58\$3 = 2 OR<br/>         sc2_58\$4 = 2</p> <p>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b></p> | INDICATOR: #8 |

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| sc2_5_9_RECORD\$1<br>sc2_5_9_RECORD\$2<br>sc2_5_9_RECORD\$3<br>sc2_5_9_RECORD\$4                                                                                                                                                                                                                                                                                                                                                                 | Does the record book have information on the second to last time she gave birth ? <b>O livro de registro contém informações da segunda até a última vez que a vaca pariu ?</b><br><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                                                 |               |
| <p><b>[Enumerator Instruction]:</b> If sc2_5_9_RECORD\$1 – sc2_5_9_RECORD\$4 = 1, then for questions sc2_5_9_DAY\$1 – sc2_5_9_DAY\$4 ; sc2_5_9_MONTH\$1 – sc2_5_9_MONTH\$4 ; and sc2_5_9_YEAR\$1 – sc2_5_9_YEAR\$4, fill out from the record book ; else ask only the date and fill out yourself.</p> <p><b>For example, if they say « January 1, 2019 », then enter « 1 » for the day ; « 1 » for the month ; and « 2019 » for the year</b></p> |                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                              |               |
| sc2_5_9_DAY\$1<br>sc2_5_9_DAY\$2<br>sc2_5_9_DAY\$3<br>sc2_5_9_DAY\$4                                                                                                                                                                                                                                                                                                                                                                             | When did she give birth the second to last time?<br><b>Quando ela pariu a segunda à última vez ?</b><br>Day <b>Dia</b> Day                                                                                                                                                                            | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b><br><br>*Enter number between 1 – 31<br><b>Digite o número entre 1 e 31</b> | INDICATOR: #8 |
| sc2_5_9_MONTH\$1<br>sc2_5_9_MONTH\$2<br>sc2_5_9_MONTH\$3<br>sc2_5_9_MONTH\$4                                                                                                                                                                                                                                                                                                                                                                     | Month <b>Mês</b><br>1 January <b>Janeiro</b><br>2 February <b>Fevereiro</b><br>3 March <b>Março</b><br>4 April <b>Abril</b><br>5 May <b>Maio</b><br>6 June <b>Junho</b><br>7 July <b>Julho</b>                                                                                                        | *Select only one option <b>Selecione apenas uma opção</b>                                                                                                                    | INDICATOR: #8 |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 8 August <b>Agosto</b><br>9 September <b>Setembro</b><br>10 October <b>Outubro</b><br>11 November <b>Novembro</b><br>12 December <b>Dezembro</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                  |                                                                                                    |               |
| sc2_5_9_YEAR\$1<br>sc2_5_9_YEAR\$2<br>sc2_5_9_YEAR\$3<br>sc2_5_9_YEAR\$4                                                                                                                                                                                                                                                                                                                                                                                 | Year <b>Ano</b>                                                                                                                                                                                                                                                                                                                               | *Enter --99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b> | INDICATOR: #8 |
| sc2_5_10_RECORD\$1<br>sc2_5_10_RECORD\$2<br>sc2_5_10_RECORD\$3<br>sc2_5_10_RECORD\$4                                                                                                                                                                                                                                                                                                                                                                     | Does the record book have information on when she stopped producing milk the second to last time ? <b>O livro de registro contém informações sobre quando ela parou de produzir leite da segunda ate à última vez?</b><br><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option <b>Selecione apenas uma opção</b>                                          |               |
| <p><b>[Enumerator Instruction]:</b> If sc2_5_10_RECORD\$1 – sc2_5_10_RECORD\$4 = 1, then for questions sc2_5_10_DAY\$1 – sc2_5_10_DAY\$4 ; sc2_5_10_MONTH\$1 – sc2_5_10_MONTH\$4 ; and sc2_5_10_YEAR\$1 – sc2_5_10_YEAR\$4, fill out from the record book ; else ask only the date and fill out yourself.</p> <p><b>For example, if they say « January 1, 2019 », then enter « 1 » for the day ; « 1 » for the month ; and « 2019 » for the year</b></p> |                                                                                                                                                                                                                                                                                                                                               |                                                                                                    |               |

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| sc2_5_10_DAY\$1<br>sc2_5_10_DAY\$2<br>sc2_5_10_DAY\$3<br>sc2_5_10_DAY\$4                                                                                                 | When did the cow stop producing milk the second to last time? <b>Quando a vaca parou de produzir leite da segunda até a última vez?</b><br>Day <b>Dia</b>                                                                                                                                                                                                                                                                      | *Enter number between 1 – 31<br><b>Digite o número entre 1 e 31</b>                               | INDICATOR: #8 |
| sc2_5_10_MONTH\$1<br>sc2_5_10_MONTH\$2<br>sc2_5_10_MONTH\$3<br>sc2_5_10_MONTH\$4                                                                                         | Month <b>Mês</b><br>1 January <b>Janeiro</b><br>2 February <b>Fevereiro</b><br>3 March <b>Março</b><br>4 April <b>Abril</b><br>5 May <b>Maio</b><br>6 June <b>Junho</b><br>7 July <b>Julho</b><br>8 August <b>Agosto</b><br>9 September <b>Setembro</b><br>10 October <b>Outubro</b><br>11 November <b>Novembro</b><br>12 December <b>Dezembro</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option <b>Selecione apenas uma opção</b>                                         | INDICATOR: #8 |
| sc2_5_10_YEAR\$1<br>sc2_5_10_YEAR\$2<br>sc2_5_10_YEAR\$3<br>sc2_5_10_YEAR\$4                                                                                             | Year <b>Ano</b>                                                                                                                                                                                                                                                                                                                                                                                                                | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b> | INDICATOR: #8 |
| <b>[Enumerator Instruction]: For producers with 10 or more cows ask the following questions <i>Para produtores com 10 ou mais vacas, faça as seguintes perguntas</i></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                   |               |
| Sc2_10_RECORD                                                                                                                                                            | Do you have a recordbook for your cows ? <b>Você tem um livro de registros para suas vacas?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                                                                                                                                                                         | *Ask if s2_6_3_2>10<br><br>*Select only one option option<br><b>Selecione apenas uma opção</b>    |               |

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|                        | -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| <b>Sc2_10_1_RECORD</b> | Does the record book have information on the typical lactation period in the last 12 months (July 1, 2018 – June 30, 2019)? <b>O livro de registro contém informações sobre o período típico de lactação nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br><br>*Select only one option <b>Selecione apenas uma opção</b>                                                                                                                                                                                                                                                                                                                  |  |
| <b>sc2_10</b>          | On average, what was the typical lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Em média, qual foi o período típico de lactação para suas vacas nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</b>                                                                                                                                    | *Ask if s2_6_3_2>10<br>*If sc2_10_RECORD_1 = 1 then enter from record book ; else ask respondent and fill out <b>preencha do livro de registro;ou pergunte ao entrevistado e preencha</b><br>*Enter in days <b>preencha em dias</b><br>*Enter 0 if no cow produces milk <b>Digite 0 se nenhuma vaca produz leite</b><br>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b> |  |
| <b>Sc2_10_2_RECORD</b> | Does the record book have information on the minimum lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)? <b>O livro de registro contém informações sobre o período mínimo de lactação para</b>                                                                                                                                                                   | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br>*Select only one option <b>Selecione apenas uma opção</b>                                                                                                                                                                                                                                                                                                                      |  |



|                 |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                     |  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                 | <p>suas vacas nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                     |  |
| Sc2_10_1        | <p>What is the minimum lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)? Qual é o período mínimo de lactação para suas vacas nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</p>                                                                                                                                                                                | <p>*Ask if s2_6_3_2&gt;10</p> <p>**Enter in days Insire em dias</p> <p>*Enter 0 if no cow produces milk Digite 0 se nenhuma vaca produz leite</p> <p>*Enter -99 if Do not know/refuse to answer Digite -99 se não sabe ou se recusa a responder</p> |  |
| Sc2_10_3_RECORD | <p>Does the record book have information on the maximum lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)? livro de registro contém informações sobre o período máximo de lactação para suas vacas nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p> | <p>*Ask if s2_6_3_2&gt;10 and sc2_10_RECORD=1</p> <p>*Select only one option Selecione apenas uma opção</p>                                                                                                                                         |  |
| Sc2_10_2        | <p>What is the maximum lactation period for your cows in the last 12 months (July 1, 2018 – June 30, 2019)? Qual é o período máximo de lactação para suas vacas nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</p>                                                                                                                                                                                | <p>*Ask if s2_6_3_2&gt;10</p> <p>**Enter in days Insire em dias</p> <p>*Enter 0 if no cow produces milk Digite 0 se nenhuma vaca produz leite</p>                                                                                                   |  |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                          |  |
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|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b>                        |  |
| <b>Sc2_10_4_RECORD</b> | Does the record book have information on in the last 12 months (July 1, 2018 – June 30, 2019), how many days passed between calves for your cows? (i.e. what is the calving interval?) <b>O livro de registro contém informações nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019), sobre quantos dias se passaram entre os nascimentos de vitelos de suas vacas? (ou seja, qual é o intervalo de partos?)</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br>*Select only one option <b>Selecione apenas uma opção</b>                     |  |
| <b>sc2_11</b>          | On average, in the last 12 months (July 1, 2018 – June 30, 2019), how many days pass between calves for your cows? (i.e. what is the calving interval?) <b>Em média, nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019), quantos dias se passam entre os nascimentos de vitelos das suas vacas? (ou seja, qual é o intervalo de partos?)</b>                                                                                                                                                                                        | *Ask if s2_6_3_2>10<br>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b> |  |
| <b>Sc2_10_5_RECORD</b> | Does the record book have information on in the last 12 months (July 1, 2018 – June 30, 2019), what is the minimum number of days that passed between calves for your cows? (i.e. what is the minimum calving interval?) <b>O livro de registro contém informações nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019), sobre qual é o número mínimo de dias entre os nascimentos de vitelos de suas vacas? (ou seja, qual é o intervalo mínimo de partos?)</b>                                                                     | *Ask if s2_6_3_2>10 and sc2_10_RECORD=1<br>*Select only one option <b>Selecione apenas uma opção</b>                     |  |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                        |  |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--|
|                        | <p>1 Yes <b>Sim</b></p> <p>2 No <b>Nao</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                        |  |
| <b>sc2_11_1</b>        | <p>In the last 12 months (July 1, 2018 – June 30, 2019), what is the minimum number of days that passed between calves for your cows? (i.e. what is the minimum calving interval?) <b>Nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019), qual é o número mínimo de dias que passaram entre os nascimentos de vitelos de suas vacas? (ou seja, qual é o intervalo mínimo de partos?)</b></p>                                                                                                                                                                                                                       | <p>*Ask if s2_6_3_2&gt;10</p> <p>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b></p> |  |
| <b>Sc2_10_6_RECORD</b> | <p>Does the record book have information on in the last 12 months (July 1, 2018 – June 30, 2019), what is the maximum number of days that passed between calves for your cows? (i.e. what is the maximum calving interval?) <b>O livro de registro contém informações nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019), sobre qual é o número máximo de dias que passaram entre os nascimentos de vitelos de suas vacas? (ou seja, qual é o intervalo máximo de partos?)</b></p> <p>1 Yes <b>Sim</b></p> <p>2 No <b>Nao</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p> | <p>*Ask if s2_6_3_2&gt;10 and sc2_10_RECORD=1</p> <p>*Select only one option <b>Selecione apenas uma opção</b></p>                     |  |
| <b>sc2_11_2</b>        | <p>In the last 12 months (July 1, 2018 – June 30, 2019), what is the maximum number of days that passed between calves for your cows? (i.e. what is the maximum calving interval?) <b>Nos últimos 12 meses (1 de julho de 2018 - 30</b></p>                                                                                                                                                                                                                                                                                                                                                                                     | <p>*Ask if s2_6_3_2&gt;10</p> <p>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b></p> |  |

|  |                                                                                                                                                               |  |  |
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|  | de junho de 2019), qual é o número máximo de dias que passaram entre os nascimentos de vitelos de suas vacas? (ou seja, qual é o intervalo máximo de partos?) |  |  |
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### **SECTION 3 : PRODUCTION PRACTICES**

**[Transition]: Enumerator: Thank you! Now we want to talk about your dairy production practices. Inquiridor : Muito obrigado ! Agora vamos falar acerca da suas práticas de manejo da produção de leite**

| VARIABLES | PRODUCTION PRACTICES                                                                                                                                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                                                                         | PMP INDICATOR |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------|
| sc3_1_1   | Do you graze your dairy cattle? <b>Você pasta seu gado leiteiro</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                    | *Select only one option<br><b>Selecione apenas uma opção</b><br>*If sc3_1_1 = 2 OR sc3_1_1 = -99, go to sc3_1_7 |               |
| sc3_1_2   | What grazing system do you follow for your dairy cattle?<br><b>Que sistema de pastoreio você segue para o seu gado leiteiro?</b><br>1 Free grazing <b>pastoreio livre</b><br>2 Partial grazing <b>pastoreio parcial</b><br>3 Paddock grazing <b>pastoreio cercado</b><br>-99 Do not know/refuse to answer | *Select all that apply <b>Selecione apenas uma opção</b><br><br>*Ask if sc3_1_1 = 1                             |               |
| sc3_1_4   | How long does it take you to get your cattle to pasture? (in minutes) <b>Quanto tempo você leva para colocar seu gado no pasto? (em minutos)</b>                                                                                                                                                          | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b>               |               |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                |                |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------|
| sc3_1_5   | How easy or difficult is it for you to access adequate grazing for your dairy cattle? <b>Quão fácil ou difícil é para ter acesso adequada pastagem para o ao seu gado leiteiro?</b><br>1 Very easy <b>muito facil</b><br>2 Somewhat easy <b>um pouco fácil</b><br>3 Neither easy nor difficult <b>nem fácil nem difícil</b><br>4 Somewhat difficult <b>um pouco difícil</b><br>5 Very difficult <b>muito difícil</b><br>-99 Do not know/refuse to answer                     | *Select only one option<br><b>Selecione apenas uma opção</b>                                                   | INDICATOR: #13 |
| sc3_1_6   | Do you pay for access to grazing? <b>Você paga para o acesso à pastagem?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                              | *Select only one option<br><b>Selecione apenas uma opção</b>                                                   |                |
| sc3_1_7   | Did you provide supplements to your dairy cattle over the last 12 months? That is, in addition to grazing, other types of food such as ration, salt, melasos, etc. are given. <b>Você forneceu suplementos ao seu gado leiteiro nos últimos 12 meses? Ou seja, além do pastoreio, são dados outros tipos de alimentos, como ração, sal, melaços, etc.</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b><br>*If sc3_1_7 = 2 OR sc3_1_ = -99, go to sc3_3_1 | INDICATOR: #10 |
|           | What type of supplement did you use? <b>Que tipo de suplemento você usou?</b>                                                                                                                                                                                                                                                                                                                                                                                                | *Read out choices one at a time<br><b>Leia as escolhas uma de cada vez</b><br>*Ask if sc3_1_7 = 1              |                |
| sc3_2_2_1 | Salt <b>Sal</b><br>1 Yes <b>Sim</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          | *Select only one option<br><b>Selecione apenas uma opção</b>                                                   |                |

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|           | 2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                       |                                                       |  |
| sc3_2_2_2 | Molasses melaço<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                       | *Select only one option<br>Selecione apenas uma opção |  |
| sc3_2_2_3 | Maize bran Farelo de milho<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                            | *Select only one option<br>Selecione apenas uma opção |  |
| sc3_2_2_4 | Wheat bran Farelo de trigo<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                            | *Select only one option<br>Selecione apenas uma opção |  |
| sc3_2_2_5 | Beer residue resíduo de cerveja<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                       | *Select only one option<br>Selecione apenas uma opção |  |
| sc3_2_2_6 | Ration/Industrial feed Ração / alimentação industrial<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder | *Select only one option<br>Selecione apenas uma opção |  |

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| sc3_2_2_7  | Mineral blocks <b>blocos minerais</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                                              | *Select only one option<br><b>Selecione apenas uma opção</b>                        |                |
| sc3_2_2_8  | Crop residues stored <b>Resíduos da colheita armazenado</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                        | *Select only one option<br><b>Selecione apenas uma opção</b>                        |                |
| sc3_2_2_9  | Crop residues fresh <b>Resíduos de colheita fresco</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                             | *Select only one option<br><b>Selecione apenas uma opção</b>                        |                |
| sc3_2_2_10 | Crop residues silage <b>Silagem de resíduos de culturas</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                        | *Select only one option<br><b>Selecione apenas uma opção</b>                        |                |
| sc3_2_3    | How easy or difficult is it for you to access adequate supplementation for your dairy cattle?<br><b>Quão fácil ou difícil é para você ter acesso à suplementação adequada para o seu gado leiteiro?</b><br>6 Very easy <b>muito fácil</b><br>7 Somewhat easy <b>um pouco fácil</b><br>8 Neither easy nor difficult <b>Nem fácil nem difícil</b><br>9 Somewhat difficult <b>um pouco difícil</b><br>10 Very difficult <b>muito difícil</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if sc3_1_7 = 1<br>*Select only one option<br><b>Selecione apenas uma opção</b> | INDICATOR: #13 |

|           |                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                         |                   |
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| sc3_2_4_A | Where do you get the supplements? <b>Onde você obtém os suplementos?</b><br>5 Input supplier <b>fornecedores de insumos</b><br>6 Veterinary store <b>loja veterinária</b><br>7 Other farmers <b>outros agricultores</b><br>8 Other, specify <b>outros, especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select all that apply <b>Selecione tudo que se aplica</b><br>*Ask if sc3_1_7 = 1                                                                                       |                   |
| sc3_2_4   | How much was your spending on supplements in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quanto você gastou em suplementos nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</b>                                                                                                                                         | *Ask if sc3_1_7 = 1<br>*Enter in Metical <b>Insire em Meticais</b><br>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b> | INDICATOR: #1; #8 |
| sc3_3_1   | Do you use fodder to feed your cattle herd? <b>Você usa forragem para alimentar seu rebanho de gado?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                        | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                                            | INDICATOR: #10    |
|           | What form of fodder do you use? <b>Que tipo de forragem você usa?</b>                                                                                                                                                                                                                                                                              | *Ask each below separately<br>*Ask if sc3_3_1 = 1                                                                                                                       |                   |
| sc3_3_2_1 | Fresh <b>Fresco</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                             | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                                            |                   |
| sc3_3_2_2 | Hay <b>Feno</b><br>1 Yes <b>Sim</b>                                                                                                                                                                                                                                                                                                                | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                                            |                   |



|           |                                                                                                                                                                                                                      |                                                                                         |  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--|
|           | 2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                          |                                                                                         |  |
| sc3_3_2_3 | Silage <b>Silagem</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                             | *Select only one option<br><b>Selecione apenas uma opção</b>                            |  |
|           | Where did you get fodder during the last 12 months (July 2018 – July 2019)? <b>Onde você conseguiu forragem durante os últimos 12 meses (julho de 2018 - julho de 2019)?</b>                                         | *Ask each below separately<br>*Ask if sc3_3_2_2 = 1 OR<br>sc3_3_2_3 = 1                 |  |
| sc3_3_4_1 | Own production <b>Produção propria</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                            | *Select only one option<br><b>Selecione apenas uma opção</b>                            |  |
| sc3_3_4_2 | Pasture zone (they went to search in the bush) <b>Zona de pasto (eles foram procurar na mata)</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b>                            |  |
| sc3_3_4_3 | Purchased <b>Comprado</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                         | *Select only one option<br><b>Selecione apenas uma opção</b>                            |  |
| sc3_3_5   | Who was your supplier? <b>Quem foi seu fornecedor</b><br>1 Input supplier <b>Fornecedor de insumos</b><br>2 Other farmers <b>Outros agricultores</b>                                                                 | *Select all that apply <b>Selecione tudo que se aplica</b><br><br>*Ask if sc3_3_4_3 = 1 |  |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                       |                |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------|
|         | <p>3 Veterinary store/other stores <b>loja veterinária / outras lojas</b></p> <p>4 Other, specify <b>Outro, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                                                                                                                                                                                                                                               |                                                                                                                                       |                |
| sc3_3_7 | <p>What is the total area where you planted fodder in the last 12 months (July 1, 2018 – June 30, 2019) (in hectares)? <b>Qual é a área total onde você plantou forragem nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019) (em hectares)?</b></p>                                                                                                                                                                                                                                                                               | <p>*Ask if sc3_3_4_1 = 1</p> <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe ou se recusa a responder</b></p> | INDICATOR: #11 |
| sc3_3_8 | <p>How easy or difficult is it access to adequate fodder for your dairy cattle? (scale) <b>Quão fácil ou difícil é o acesso a forragem adequada para o seu gado leiteiro? (escala)</b></p> <p>1 Very easy <b>muito fácil</b></p> <p>2 In a way easy <b>De alguma forma facil</b></p> <p>3 Neither easy nor difficult <b>Nem fácil nem difícil</b></p> <p>4 In a way difficult <b>De alguma forma difícil</b></p> <p>5 Very difficult <b>Muito difícil</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p> | <p>*Ask if sc3_3_1 = 1</p> <p>*Select only one option <b>Selecione apenas uma opção</b></p>                                           | INDICATOR: #13 |
| sc3_4_1 | <p>How does your dairy have access to drinking water when it is in the Kraal? <b>Como o seu gado leiteiro tem acesso a água potável quando está no Kraal?</b></p> <p>1 Has continuous access to water <b>Tem acesso contínuo a água</b></p> <p>2 Bring water to livestock <b>Trazer água para o gado</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                                                                  | <p>*Select only one option <b>Selecione apenas uma opção</b></p>                                                                      | INDICATOR: #10 |
| sc3_4_2 | <p>How much water (L) on average did you bring to each animal per day in the last 12 months (July 1, 2018 – June 30,</p>                                                                                                                                                                                                                                                                                                                                                                                                                      | *Ask if sc3_4_1 = 2                                                                                                                   |                |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                    |  |
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|         | 2019)? <b>Quanta água (L), em média, você traz para cada animal por dia nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                                                                                                                                                                                                                                                                              | *Enter -99 if do not know/refuse to answer answer<br><b>Digite -99 se não sabe ou se recusa a responder</b>                        |  |
| sc3_4_3 | How does your dairy have access to water while grazing?<br><b>Como o seu gado leiteiro tem acesso a água durante o pastoreio?</b><br>1 Has continuous access to water sources <b>Tem acesso contínuo a fontes de água</b><br>2 I take the cattle to the water <b>Eu levo o gado para a água</b><br>3 I bring water to cattle <b>Eu trago água para o gado</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                       |  |
| sc3_4_4 | How much water (L) on average do you bring to each animal per day in the last 12 months (July 1, 2018 – June 30, 2019)?<br><b>Quanta água (L), em média, você traz para cada animal por dia nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</b>                                                                                                                                                                         | *Ask if sc3_4_3 = 3<br>*Enter -99 if do not know/refuse to answer answer<br><b>Digite -99 se não sabe ou se recusa a responder</b> |  |
| sc3_4_6 | Do you pay for access to water for your dairy cattle? <b>Você paga pelo acesso à água para o seu gado leiteiro?</b><br>1 Yes<br>2 No<br>-99 Do not knw/refuse to asnwer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                           | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                       |  |
| sc3_5_1 | Where are your cattle kept? <b>Onde seu gado é mantido?</b><br>1 Kraal <b>Kraal</b><br>2 Veranda <b>Varanda</b><br>3 Under the tree <b>Debaixo da árvore</b><br>-99 Do not know/refuse to answer                                                                                                                                                                                                                                          | *Select all that apply <b>Selecione tudo que se aplica</b>                                                                         |  |

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                   |                           |
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| sc3_5_1_1       | <p>Which of the following do you have in your kraal ? <b>Qual dos seguintes você tem em seu kraal?</b></p> <p>1 Feeder/food receptacle <b>alimentador / comedouro</b></p> <p>2 Water cooler/water receptacle <b>Recipiente para água / bebedouro</b></p> <p>3 Sheet cover to give shade <b>cobertura para dar sombra</b></p> <p>4 Cement in the milking area <b>Cimento na área de ordenha</b></p> <p>5 A dry ground <b>Um solo seco</b></p> <p>6 Other, specify <b>Outros especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p> | <p>*Ask if sc3_5_1 = 1</p> <p>*Read all options <b>Leia todas as opções</b></p> <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> | INDICATOR: #26            |
| sc3_6_1         | <p>Do you milk by machine or by hand? <b>Você ordenha por máquina ou manualmente?</b></p> <p>1 Machine <b>máquina</b></p> <p>2 By hand <b>Manualmente</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                                                                                                                                                                                                                                                  | <p>*Select all that apply <b>Selecione tudo que se aplica</b></p>                                                                                 | INDICATORS: #10; #25, #26 |
| sc3_6_3_1       | <p>Where did you acquire your milking machine? <b>Onde você adquiriu sua máquina de ordenha?</b></p> <p>1 Land O'Lakes (MERCADO?) <b>Land O'Lakes (MERCADO?)</b></p> <p>2 Stores of agricultural and veterinary inputs <b>Lojas de insumos agrícolas e veterinários</b></p> <p>3 Local market <b>Mercado local</b></p> <p>4 Cooperative <b>Cooperativa</b></p> <p>5 Other <b>Outros</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                    | <p>*Ask if sc3_6_1 = 1</p> <p>*Select all that apply <b>Selecione tudo que se aplica</b></p>                                                      |                           |
| sc3_6_3_5_OTHER | <p>Other (specify) <b>Outro especifique</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>*Ask if sc3_6_3 = 5</p>                                                                                                                        |                           |

|                 |                                                                                                                                                                                                                  |                                                              |  |
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|                 | If you needed a new milking machine, where could you get one? <i>Se você precisasse de uma nova máquina de ordenha, onde você poderia obter uma?</i>                                                             | *Select all that apply <i>Selecione tudo que se aplica</i>   |  |
| sc3_6_4_1       | Land O'Lakes /MERCADO<br>1 Yes <i>Sim</i><br>2 No <i>Nao</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i>                                                                         | *Select only one option<br><i>Selecione apenas uma opção</i> |  |
| sc3_6_4_2       | Stores of agricultural and veterinary inputs <i>Lojas de insumos agrícolas e veterinários</i><br>1 Yes <i>Sim</i><br>2 No <i>Nao</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i> | *Select only one option<br><i>Selecione apenas uma opção</i> |  |
| sc3_6_4_3       | Local market <i>Mercado local</i><br>1 Yes <i>Sim</i><br>2 No <i>Nao</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i>                                                             | *Select only one option<br><i>Selecione apenas uma opção</i> |  |
| sc3_6_4_4       | Cooperative <i>Cooperativa</i><br>1 Yes <i>Sim</i><br>2 No <i>Nao</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i>                                                                | *Select only one option<br><i>Selecione apenas uma opção</i> |  |
| sc3_6_4_5       | Other <i>Outros</i><br>1 Yes <i>Sim</i><br>2 No <i>Nao</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i>                                                                           | *Select only one option<br><i>Selecione apenas uma opção</i> |  |
| sc3_6_4_5_OTHER | Other, please specify <i>Outros , por favor especifique</i>                                                                                                                                                      | *Ask if sc3_6_4_5 = 1                                        |  |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                              |                |
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| sc3_6_5 | How easy or difficult is to access a new milking machine?<br>(scale) <b>Quão fácil ou difícil é obter (acessar) uma nova máquina de ordenha? (escala)</b><br>1 Very easy <b>Muito facil</b><br>2 In a way easy <b>De alguma forma facil</b><br>3 Neither easy nor difficult <b>Nem facil nem dificil</b><br>4 In a way difficult <b>De alguma forma dificil</b><br>5 Very difficult <b>Muito dificil</b><br>-99 Do not know/refuse to answer | *Select only one option<br><b>Selecione apenas uma opção</b> |                |
| sc3_7_1 | Do you inspect for mastitis before milking? <b>Você inspeciona mastite antes da ordenha?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                              | *Select only one option<br><b>Selecione apenas uma opção</b> | INDICATOR: #25 |
|         | What means do you use to test for mastitis? <b>Que meios você usa para testar a mastite?</b>                                                                                                                                                                                                                                                                                                                                                 | *Ask each option separately<br>*Ask if sc3_7_1 = 1           |                |
| visual  | Visual inspection of the udder for inflammation <b>Inspeção visual do úbere para inflamação</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                           | *Select only one option<br><b>Selecione apenas uma opção</b> |                |
| cup     | Visual inspection of milk using strip cup <b>Inspeção visual do leite usando o copo de tiras</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                          | *Select only one option<br><b>Selecione apenas uma opção</b> | INDICATOR: #10 |
| cmt     | CMT test <b>Teste de CMT</b><br>1 Yes <b>Sim</b>                                                                                                                                                                                                                                                                                                                                                                                             | *Select only one option<br><b>Selecione apenas uma opção</b> | INDICATOR: #10 |

|           |                                                                                                                                                                                      |                                                                    |  |
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|           | 2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                                                        |                                                                    |  |
|           | If you need to get a new strip cup or CMT kits where can you get them? Se você precisa de um novo copo de tiras ou kits de CMT, onde você pode obtê-los?                             | *Ask each option separately<br>Pergunte a cada opção separadamente |  |
| sc3_7_4_1 | Land O'Lakes /MERCADO<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                  | *Select only one option<br>Selecione apenas uma opção              |  |
| sc3_7_4_2 | Stores of agricultural and veterinary inputs Lojas de insumos agrícolas e veterinários<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder | *Select only one option<br>Selecione apenas uma opção              |  |
| sc3_7_4_3 | Local market Mercado local<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                             | *Select only one option<br>Selecione apenas uma opção              |  |
| sc3_7_4_7 | Imported Importado<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                     | *Select only one option<br>Selecione apenas uma opção              |  |
| sc3_7_4_4 | Cooperative Cooperativa<br>1 Yes Sim<br>2 No Nao                                                                                                                                     | *Select only one option<br>Selecione apenas uma opção              |  |

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|                 | -99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                                                                                                                                                                                                                                                                                       |                                                                          |                           |
| sc3_7_4_5       | Other Outros<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                                                                                                                                                                                                                                              | *Select only one option<br>Selecione apenas uma opção                    |                           |
| sc3_7_4_5_OTHER | Other, please specify Outros , por favor especifique                                                                                                                                                                                                                                                                                                                                                    | *Ask if sc3_7_4_5 = 1                                                    |                           |
| sc3_7_9         | How easy or difficult is it to access more CMT kit when you need them? Quão fácil ou difícil é obter (acessar) mais kit CMT quando você precisar deles?<br>1 Very easy Muito facil<br>2 In a way easy De alguma forma facil<br>3 Neither easy nor difficult Nem facil nem dificil<br>4 In a way difficult De alguma forma dificil<br>5 Very difficult Muito dificil<br>-99 Do not know/refuse to answer | *Ask if cmt = 1<br>*Select only one option<br>Selecione apenas uma opção | INDICATOR: #13            |
| sc3_8           | Do you use stainless steel buckets and/or stainless steel milk cans for milk? Você usa baldes de aço inoxidável e / ou bilhas de leite para o leite?<br>1 No não<br>2 Buckets only Apenas baldes<br>3 Milk cans only Apenas bilhas de leite<br>4 Both Ambos<br>-99 Do not know/refuse to answer                                                                                                         | *Select only one option<br>Selecione apenas uma opção                    | INDICATORS: #10; #25, #26 |
|                 | If you need a new stainless steel bucket and/or stainless steel milk can from where can you get it? Se você precisa de um novo balde de aço inoxidável e / ou uma bilha de leite de aço inoxidável de onde você pode obtê-lo ?                                                                                                                                                                          | *Ask each option separately                                              |                           |



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| sc3_8_1_1 | Land O'Lakes / MERCADO<br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                        | *Select only one option<br><b>Selecione apenas uma opção</b> |  |
| sc3_8_1_2 | Stores of agricultural and veterinary inputs <b>Lojas de insumos agrícolas e veterinários</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b> |  |
| sc3_8_1_3 | Local market <b>Mercado local</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                             | *Select only one option<br><b>Selecione apenas uma opção</b> |  |
| sc3_8_1_7 | Imported <b>Importado</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                     | *Select only one option<br><b>Selecione apenas uma opção</b> |  |
| sc3_8_1_4 | Cooperative <b>Cooperativa</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                | *Select only one option<br><b>Selecione apenas uma opção</b> |  |
| sc3_8_1_5 | Other <b>Outros</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                           | *Select only one option<br><b>Selecione apenas uma opção</b> |  |

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| sc3_8_1_5_OTHER | Other, please specify <b>Outros , por favor especifique</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | *Ask if sc3_8_1_5 = 1                                                     |                |
| sc3_8_1_6       | Don't know <b>Nao sabe</b><br>1 Yes<br>2 No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | *Select only one option<br><b>Selecione apenas uma opção</b>              |                |
| sc3_8_5         | How easy or difficult is it to get a new stainless steel bucket and/or a stainless steel milk can? (scale) <b>Quao fácil ou difícil obter um novo balde de aço inoxidável e / ou uma bilha de leite de aço inoxidável? (escala)</b><br>1 Very easy <b>muito fácil</b><br>2 In a way easy <b>De uma maneira fácil</b><br>3 Neither easy nor difficult <b>Nem fácil nem difícil</b><br>4 In a way difficult <b>De uma maneira difícil</b><br>5 Very difficult <b>Muito difícil</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b>              | INDICATOR: #13 |
| sc3_8_01        | Did you use chilling facilities for milk in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Você usou instalações de refrigeração para leite nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                                                                                                 | *Select only one option<br><b>Selecione apenas uma opção</b>              | INDICATOR: #14 |
|                 | If you need new milk chilling equipment from where can you get it? <b>If you need new milk chilling equipment from where can you get it? Se precisar de um novo equipamento de refrigeração onde pode obter?</b>                                                                                                                                                                                                                                                                                                                                             | *Ask each option separately<br><b>Pergunte a cada opção separadamente</b> |                |
| sc3_8_01_1      | Land O'Lakes / MERCADO<br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                                                                                                    | *Select only one option<br><b>Selecione apenas uma opção</b>              |                |

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| sc3_8_01_2       | Stores of agricultural and veterinary inputs <b>Lojas de insumos agrícolas e veterinários</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b> |                         |
| sc3_8_01_3       | Local market <b>Mercado local</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                             | *Select only one option<br><b>Selecione apenas uma opção</b> |                         |
| sc3_8_01_4       | Imported<br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                      | *Select only one option<br><b>Selecione apenas uma opção</b> |                         |
| sc3_8_01_5       | Cooperative <b>Cooperativa</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                | *Select only one option<br><b>Selecione apenas uma opção</b> |                         |
| sc3_8_01_6       | Other <b>Outros</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                           | *Select only one option<br><b>Selecione apenas uma opção</b> |                         |
| sc3_8_01_6_OTHER | Other, please specify <b>Otros , por favor especifique</b>                                                                                                                                                       | *Ask if sc3_8_01_5 = 1                                       |                         |
| sc3_8_02         | Did you use milk filters in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Você usou filtros de leite nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                | *Select only one option<br><b>Selecione apenas uma opção</b> | INDICATORS:<br>#14; #25 |

|            |                                                                                                                                                    |                                                                           |  |
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|            | 1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                  |                                                                           |  |
|            | If you need a new milk filter from where can you get it? <b>Se você precisa de um novo filtro de leite de onde você pode obtê-lo?</b>              | *Ask each option separately<br><b>Pergunte a cada opção separadamente</b> |  |
| sc3_8_02_1 | Land O'Lakes / MERCADO<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                        | *Select only one option<br><b>Selecione apenas uma opção</b>              |  |
| sc3_8_02_2 | Stores of agricultural and veterinary inputs <b>Lojas de insumos agrícolas e veterinários</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option<br><b>Selecione apenas uma opção</b>              |  |
| sc3_8_02_3 | Local market <b>Mercado local</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                             | *Select only one option<br><b>Selecione apenas uma opção</b>              |  |
| sc3_8_02_4 | Imported <b>Importado</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                     | *Select only one option<br><b>Selecione apenas uma opção</b>              |  |
| sc3_8_02_5 | Cooperative <b>Cooperativa</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>  | *Select only one option<br><b>Selecione apenas uma opção</b>              |  |
| sc3_8_02_6 | Other <b>Outros</b><br>1 Yes <b>Sim</b>                                                                                                            | *Select only one option<br><b>Selecione apenas uma opção</b>              |  |

|                  |                                                                                                                                                                                                                                                                                                              |                                                                  |                |
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|                  | 2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                  |                                                                  |                |
| sc3_8_02_6_OTHER | Other, please specify <b>Outros , especifique</b>                                                                                                                                                                                                                                                            | *Ask if sc3_8_02_5 = 1                                           |                |
| sc3_8_03         | Did you use milk feeders in the last 12 months (July 1, 2018 – June 30, 2019) ? <b>Você usou alimentadores de leite nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b>     | INDICATOR: #14 |
|                  | If you need a new milk feeder from where can you get it? <b>Se você precisa de um novo alimentador de leite de onde você pode obtê-lo?</b>                                                                                                                                                                   | *Ask each option separately<br><b>Selecione apenas uma opção</b> |                |
| sc3_8_03_1       | Land O'Lakes / MERCADO<br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                    | *Select only one option<br><b>Selecione apenas uma opção</b>     |                |
| sc3_8_03_2       | Stores of agricultural and veterinary inputs <b>Lojas de insumos agrícolas e veterinários</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                             | *Select only one option<br><b>Selecione apenas uma opção</b>     |                |
| sc3_8_03_3       | Local market <b>Mercado local</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                         | *Select only one option<br><b>Selecione apenas uma opção</b>     |                |

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| sc3_8_03_4                                                                                                                                                         | Imported <b>Importado</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                     | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                |                |
| sc3_8_03_5                                                                                                                                                         | Cooperative <b>Cooperativa</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                |                |
| sc3_8_03_6                                                                                                                                                         | Other <b>Other</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                            | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                |                |
| sc3_8_03_6_OTHER                                                                                                                                                   | Other, please specify <b>Outros , por favor especifique</b>                                                                                                                                      | *Ask if sc3_8_03_5 = 1                                                                                                                      |                |
| Sc8_01                                                                                                                                                             | Does your household have a milk tank? <b>Sua casa tem um tanque de leite?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option<br><b>Selecione apenas uma opção</b>                                                                                |                |
| sc8_02                                                                                                                                                             | What is the capacity of the milk tank (or total capacity in the various tanks)? <b>Qual é a capacidade do tanque de leite (ou capacidade total nos vários tanques)?</b>                          | *Ask if sc8_01 =1<br>*Enter in liters<br>*Enter -99 if Do not know/refuse to answer <b>Digite - 99 se não sabe ou se recusa a responder</b> | INDICATOR: #27 |
| <b>[Transition]</b> Enumerator : Now I would like to ask you about your business planning <b>Agora eu gostaria de perguntar sobre seu planejamento de negócios</b> |                                                                                                                                                                                                  |                                                                                                                                             |                |

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| Sc3_9_1                                                                                                                                                                                                          | Have you ever developed a business plan for your dairy activities? <i>Você já desenvolveu um plano de negócios para suas atividades leiteiras?</i><br>1 Yes <i>Sim</i><br>2 No <i>Nao</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i>                                                                                                 | *Select only one option<br><i>Selecione apenas uma opção</i>                        | INDICATOR: #12 |
| Sc3_9_2                                                                                                                                                                                                          | Did you use a business plan for your dairy activities in the last 12 months (July 1, 2018 – June 30, 2019)? <i>Você usou um plano de negócios para suas atividades leiteiras nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</i><br>1 Yes <i>Sim</i><br>2 No <i>Nao</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i> | *Ask if sc3_9_1 = 1<br>*Select only one option<br><i>Selecione apenas uma opção</i> | INDICATOR: #12 |
| <i>[Transition]: Enumerator: Now I would like to ask you about any milk testing done by you prior to selling Agora eu gostaria de lhe perguntar sobre qualquer teste de leite feito por você antes de vender</i> |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |                |
| Sc3_10_1                                                                                                                                                                                                         | Do you do any quality testing on your milk before selling it? <i>Você faz algum teste de qualidade em seu leite antes de vendê-lo</i><br>1 Yes <i>Sim</i><br>2 No <i>Nao</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i>                                                                                                              | *Select only one option<br><i>Selecione apenas uma opção</i>                        | INDICATOR: #26 |
| Sc3_10_2                                                                                                                                                                                                         | What do you test for? <i>O que você testa?</i><br>1 Water adulteration 1 <i>adulteração da água</i><br>2 Bacteria 2 <i>bactérias</i><br>3 Butter and fat content 3 <i>Manteiga e teor de gordura</i><br>4 Antibiotic residue <i>Antibiotic residue</i><br>5 Other, specify <i>Outros , especifique</i>                                                                | *Select all that apply<br>*Ask if sc3_10_1=1<br>*Prompt with responses              | INDICATOR: #26 |

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|  | -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> |  |  |
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## **SECTION 4: ANIMAL HEALTH SERVICES**

**[Transition]: Enumerator: Thank you! Now I would like to talk to you about your herd's overall health and your use of animal health services** ***Agora eu gostaria de falar com você sobre a saúde geral de seu rebanho e seu uso de serviços de saúde animal***

| VARIABLES     | ANIMAL HEALTH SERVICES                                                                                                                                                                                                                                                                                                                                                                                                     | ENUMERATOR INSTRUCTIONS                                                                                  | PMP INDICATORS |
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| sc4_1         | Did you or an animal health provider test any of your cattle for any disease in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Você ou algum profissional de saúde animal testou algum de seus bovinos por qualquer doença nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option <b>Selecione apenas uma opção</b><br>*If sc4_1 = 2 OR sc4_1 = -99 go to sc4_6_10 |                |
| sc4_6_9_0\$1  | Were they tested for Brucellosis? <b>Eles foram testados para Brucelose?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                            | *Ask if sc4_1 = 1<br>*Select only one option <b>Selecione apenas uma opção</b>                           |                |
| sc4_6_9_10\$1 | Who tested for Brucellosis? <b>Quem testou a Brucelose?</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b>                                                                                                                                                                                                                                                             | *Ask if sc4_6_9_0\$1 = 1<br>*Select only one option <b>Selecione apenas uma opção</b>                    |                |



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|                    | 2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians<br><b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL)</b><br>5 Livestock Technician <b>Técnico de Pecuária</b><br>6 Other (please specify) <b>Outros ( por favor especifique)</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> |                                                                                       |  |
| sc4_6_9_1_OTHER\$1 | Other (please specify) <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                     | *Ask if sc4_6_9_10\$1 = 6                                                             |  |
| sc4_6_9_0\$2       | Were they tested for Tuberculosis? <b>Eles foram testados para tuberculose?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                | *Ask if sc4_1 = 1<br>*Select only one option <b>Selecione apenas uma opção</b>        |  |
| sc4_6_9_10\$2      | Who tested for Tuberculosis? <b>Quem testou para tuberculose?</b><br>1 Household member or hired worker<br><b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians<br><b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL)</b>                          | *Ask if sc4_6_9_0\$2 = 1<br>*Select only one option <b>Selecione apenas uma opção</b> |  |

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|                    | <p>5 Livestock Technician Técnico de Pecuária</p> <p>6 Other (please specify) Outros ( por favor especifique)</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                                                                                                                                               |                                                                                           |  |
| sc4_6_9_1_OTHER\$2 | <p>Other (please specify) Outros ( por favor especifique)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                            | *Ask if sc4_6_9_10\$2 = 6                                                                 |  |
| sc4_6_9_0\$3       | <p>Were they tested for Mastitis? Eles foram testados para mastite?</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                                                                                                                                                        | <p>*Ask if sc4_1 = 1</p> <p>*Select only one option Selecione apenas uma opção</p>        |  |
| sc4_6_9_10\$3      | <p>Who tested for Mastitis? Quem testou para mastite?</p> <p>1 Household member or hired worker membro do agregado familiar ou trabalhador contratado</p> <p>2 Promoter Promotor</p> <p>3 Private contracted veterinarians veterinários contratados</p> <p>4 Project (e.g. LOL) Projeto (por exemplo, LOL</p> <p>5 Livestock Technician Técnico de Pecuária</p> <p>6 Other (please specify) Outros ( por favor especifique)</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p> | <p>*Ask if sc4_6_9_0\$3 = 1</p> <p>*Select only one option Selecione apenas uma opção</p> |  |

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| sc4_6_9_1_OTHER\$3 | Other (please specify) <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | *Ask if sc4_6_9_10\$3 = 6                                                                        |  |
| sc4_6_9_0\$4       | <p>Were they tested for Tick-borne diseases? <b>Eles foram testados para doenças transmitidas por carrapatos?</b></p> <p>1 Yes <b>Sim</b></p> <p>2 No <b>Nao</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                                                                                                                                                                                                                                                                        | <p>*Ask if sc4_1 = 1</p> <p>*Select only one option <b>Selecione apenas uma opção</b></p>        |  |
| sc4_6_9_10\$4      | <p>Who tested for Tick-borne diseases? <b>Quem testou para as doenças transmitidas por carrapatos?</b></p> <p>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b></p> <p>2 Promoter <b>Promotor</b></p> <p>3 Private contracted veterinarians <b>veterinários contratados</b></p> <p>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL)</b></p> <p>5 Livestock Technician <b>Técnico de Pecuária</b></p> <p>6 Other (please specify) <b>Outros ( por favor especifique)</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p> | <p>*Ask if sc4_6_9_0\$4 = 1</p> <p>*Select only one option <b>Selecione apenas uma opção</b></p> |  |
| sc4_6_9_1_OTHER\$4 | Other (please specify) <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | *Ask if sc4_6_9_10\$4 = 6                                                                        |  |

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| sc4_6_9_A                                                                                                                                                                                                                            | Has your cattle been tested for other diseases? <b>Seu gado foi testado para outras doenças?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                  | *Select only one option <b>Selecione apenas uma opção</b>                                                       |               |
| sc4_6_9_0_OUTRO                                                                                                                                                                                                                      | Name disease tested for: <b>Nome da doença testada :</b>                                                                                                                                                                                                             | *Ask if sc4_6_9_A = 1                                                                                           |               |
| <b>[Transition]:</b> Enumerator: Now I would like to talk to you about any vaccinations you have done for your dairy cattle <b>Agora eu gostaria de falar com você sobre quaisquer vacinas que você fez para a sua vaca leiteira</b> |                                                                                                                                                                                                                                                                      |                                                                                                                 |               |
| sc4_6_10                                                                                                                                                                                                                             | Did you vaccinate your cattle against any diseases in the past 12 months? <b>Você vacinou seu gado contra alguma doença nos últimos 12 meses?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option <b>Selecione apenas uma opção</b><br>*If sc4_6_10 = 2 OR sc4_6_10 = -99, go to sc4_6_12 | INDICATOR #10 |
| sc4_6_11_1\$2                                                                                                                                                                                                                        | Was your cattle vaccinated for foot and mouth disease? <b>Seu gado foi vacinado para a febre aftosa?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                          | *Ask if sc4_6_10 = 1<br>*Select only one option <b>Selecione apenas uma opção</b>                               |               |
| sc4_6_11_2\$2                                                                                                                                                                                                                        | Who vaccinated the animal? <b>Quem vacinou o animal?</b>                                                                                                                                                                                                             | *Ask if sc4_6_11_1\$2 = 1                                                                                       |               |

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|                    | <p>1 Household member or hired worker<br/>membro do agregado familiar ou trabalhador contratado</p> <p>2 Promoter Promotor</p> <p>3 Private contracted veterinarian<br/>veterinários contratados</p> <p>4 Project (e.g. LOL) Projeto (por exemplo, LOL</p> <p>5 Livestock Technician Técnico de Pecuária</p> <p>6 Other, please specify Outros ( por favor especifique)</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p> | *Select all that apply Selecione tudo que se aplica                                         |  |
| sc4_6_11_2OTHER\$2 | Other, please specify Outros ( por favor especifique)                                                                                                                                                                                                                                                                                                                                                                                                | *Ask if sc4_6_11_2\$2 = 6                                                                   |  |
| sc4_6_11_1\$3      | <p>Skin diseases (eg, Lump skin disease) Doenças de pele (por exemplo, Dermatose nodular)</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                                                                              | *Select only one option Selecione apenas uma opção                                          |  |
| sc4_6_11_2\$3      | <p>Who vaccinated the animal? Quem vacinou o animal?</p> <p>1 Household member or hired worker<br/>membro do agregado familiar ou trabalhador contratado</p> <p>2 Promoter Promotor</p>                                                                                                                                                                                                                                                              | <p>*Ask if sc4_6_11_1\$3 = 1</p> <p>*Select all that apply Selecione tudo que se aplica</p> |  |

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|                    | <p>3 Private contracted veterinarian<br/>veterinários contratados</p> <p>4 Project (e.g. LOL) Projeto (por exemplo, LOL)</p> <p>5 Livestock Technician Técnico de Pecuária</p> <p>6 Other, please specify Outros ( por favor especifique)</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                 |                                                                                             |  |
| sc4_6_11_2OTHER\$3 | Other, please specify Outros ( por favor especifique)                                                                                                                                                                                                                                                                                                                  | *Ask if sc4_6_11_2\$3 = 6                                                                   |  |
| sc4_6_11_1\$4      | <p>Was your cattle vaccinated for brucellosis? Seu gado foi vacinado para brucelose?</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                     | <p>*Ask if sc4_6_10 = 1</p> <p>*Select only one option Selecione apenas uma opção</p>       |  |
| sc4_6_11_2\$4      | <p>Who vaccinated the animal? Quem vacinou o animal?</p> <p>1 Household member or hired worker<br/>membro do agregado familiar ou trabalhador contratado</p> <p>2 Promoter Promotor</p> <p>3 Private contracted veterinarian<br/>veterinários contratados</p> <p>4 Project (e.g. LOL) Projeto (por exemplo, LOL)</p> <p>5 Livestock Technician Técnico de Pecuária</p> | <p>*Ask if sc4_6_11_1\$4 = 1</p> <p>*Select all that apply Selecione tudo que se aplica</p> |  |

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|                    | <p>6 Other, please specify <b>Outros ( por favor especifique)</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                    |  |
| sc4_6_11_2OTHER\$4 | <p>Other, please specify <b>Outros ( por favor especifique)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | *Ask if sc4_6_11_2\$4 = 6                                                                          |  |
| sc4_6_11_1\$5      | <p>Anthrax <b>Carbúnculo hemático</b></p> <p>1 Yes <b>Sim</b></p> <p>2 No <b>Nao</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                       | <p>*Ask if sc4_6_10 = 1</p> <p>*Select only one option <b>Selecione tudo que se aplica</b></p>     |  |
| sc4_6_11_2\$5      | <p>Who vaccinated the animal? <b>Quem vacinou o animal?</b></p> <p>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b></p> <p>2 Promoter <b>Promotor</b></p> <p>3 Private contracted veterinarian <b>veterinários contratados</b></p> <p>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL)</b></p> <p>5 Livestock Technician <b>Técnico de Pecuária</b></p> <p>6 Other, please specify <b>Outros ( por favor especifique)</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p> | <p>*Ask if sc4_6_11_1\$5 = 1</p> <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> |  |

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| sc4_6_11_2OTHER\$5 | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                | *Ask if sc4_6_11_2\$5 = 6                                                               |  |
| sc4_6_11_1\$7      | Symptomatic carbuncle <b>Carbúnculo sintomático</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                                      | *Ask if sc4_6_10 = 1<br>*Select only one option <b>Selecione apenas uma opção</b>       |  |
| sc4_6_11_2\$7      | Who vaccinated the animal? <b>Quem vacinou o animal?</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarian <b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL)</b><br>5 Livestock Technician <b>Técnico de Pecuária</b><br>6 Other, please specify <b>Outros ( por favor especifique)</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if sc4_6_11_1\$7 = 1<br>*Select all that apply <b>Selecione tudo que se aplica</b> |  |
| sc4_6_11_2OTHER\$7 | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                | *Ask if sc4_6_11_2\$7 = 6                                                               |  |



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| sc4_6_11_1\$8      | Tuberculosis <b>Tuberculose</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                                                           | *Ask if sc4_6_10 = 1<br>*Select only one option <b>Selecione apenas uma opção</b>       |  |
| sc4_6_11_2\$8      | Who vaccinated the animal? <b>Quem vacinou o animal?</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians <b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL)</b><br>5 Livestock Technician <b>Técnico de Pecuária</b><br>6 Other, please specify <b>Outros ( por favor especifique)</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if sc4_6_11_1\$8 = 1<br>*Select all that apply <b>Selecione tudo que se aplica</b> |  |
| sc4_6_11_2OTHER\$8 | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | *Ask if sc4_6_11_2\$8 = 6                                                               |  |
| sc4_6_11_1\$1      | Do not know – only officially required vaccinations <b>Não sei - apenas vacinas oficialmente exigidas</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b>                                                                                                                                                                                                                                                                                                                                                                             | *Ask if sc4_6_10 = 1<br>*Select only one option <b>Selecione apenas uma opção</b>       |  |

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|                    | -99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                             |                |
| sc4_6_11_2\$1      | <p>Who vaccinated the animal? Quem vacinou o animal?</p> <p>1 Household member or hired worker<br/>membro do agregado familiar ou trabalhador contratado</p> <p>2 Promoter Promotor</p> <p>3 Private contracted veterinarians<br/>veterinários contratados</p> <p>4 Project (e.g. LOL) Projeto (por exemplo, LOL)</p> <p>5 Livestock Technician Técnico de Pecuária</p> <p>6 Other, please specify Outros ( por favor especifique)</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p> | <p>*Ask if sc4_6_11_1\$1 = 1</p> <p>*Select all that apply Selecione tudo que se aplica</p> |                |
| sc4_6_11_2OTHER\$1 | Other, please specify Outros ( por favor especifique)                                                                                                                                                                                                                                                                                                                                                                                                                                                           | *Ask if sc4_6_11_2\$1 = 6                                                                   |                |
| sc4_6_12           | <p>Did you treat your cattle against ticks in the last 12 months (July 1, 2018 – June 30, 2019)? Você tratou seu gado contra carraças nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</p> <p>1 Yes Sim</p> <p>2 No Não</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                            | *Select only one option Selecione apenas uma opção                                          | INDICATOR: #10 |

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| sc4_6_13         | How many days ago was the last time you treated your cattle against ticks? Há quantos dias foi o ultimo tratamento?                                                                                                                                                                                                                                                                                                                                                                       | *Ask if sc4_6_12 = 1<br>*Enter -99 if do not know/refuse to answer |  |
| sc4_6_14_2       | Who applied the treatment? Quem aplicou o tratamento<br>1 Member of household or hired laborer<br><b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians<br><b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL)</b><br>5 Livestock Technician <b>Técnico de Pecuária</b><br>6 Other <b>Outros</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select all that apply <b>Selecione tudo que se aplica</b>         |  |
| sc4_6_14_2_OTHER | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                              | *Ask if sc4_6_14_2 = 6                                             |  |
| sc4_6_15         | Have your cattle had any wounds or illnesses in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Seu gado teve alguma ferida ou doença nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b>                                                                                                                                                                                                                                   | *Select only one option <b>Selecione apenas uma opção</b>          |  |

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|               | -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                     |  |
|               | What health problems did your cattle have over the past 12 months? <b>Que problemas de saúde o seu gado teve nos últimos 12 meses?</b>                                                                                                                                                                                                                                                                                                                                                                                                                     | *Ask if sc4_6_15 = 1                                                                |  |
| sc4_6_17_1\$1 | Did your cattle have mastitis in the last 12 months (July 31, 2018 – June 30, 2019)? <b>Seu gado teve mastite nos últimos 12 meses (31 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                     | *Select only one option <b>Selecione apenas uma opção</b>                           |  |
| sc4_6_17_2\$1 | Who treated the cattle most of the time for this condition? <b>Quem tratou o gado a maior parte do tempo para essa condição?</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians <b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL</b><br>5 Livestock Technician <b>Técnico de Pecuária</b><br>6 Other <b>Outros</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if sc4_6_17_1\$1<br>*Select all that apply <b>Selecione tudo que se aplica</b> |  |

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| sc4_6_17_2_OTHER\$1 | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                           | *Ask if sc4_6_17_2\$1 = 6                                                               |  |
| sc4_6_17_3\$1       | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantas vacas tiveram esta doença nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)?</b>                                                                                                                                                                                                                                                                                         | *Ask if sc4_6_17_1\$1<br>*Enter -99 if do not know/refuse to answer                     |  |
| sc4_6_17_1\$2       | Did your cattle have any wounds in the last 12 months (July 31, 2018 – June 30, 2019)? <b>Seu gado teve alguma ferida nos últimos 12 meses (31 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                         | *Select only one option <b>Selecione apenas uma opção</b>                               |  |
| sc4_6_17_2\$2       | Who treated the cattle most of the time for this condition? <b>Quem tratou o gado a maior parte do tempo para essa condição?</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians <b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL</b><br><br>5 Livestock Technician <b>Técnico de Pecuária</b><br><br>6 Other <b>Outros</b> | *Ask if sc4_6_17_1\$2 = 1<br>*Select all that apply <b>Selecione tudo que se aplica</b> |  |

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|                     | -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                         |  |
| sc4_6_17_2_OTHER\$2 | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                              | *Ask if sc4_6_17_2\$2 = 6                                                               |  |
| sc4_6_17_3\$2       | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantas vacas tiveram esta doença nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)?</b>                                                                                                                                                                                                                                                            | *Ask if sc4_6_17_1\$2 = 1<br>*Enter -99 if do not know/refuse to answer                 |  |
| sc4_6_17_1\$3       | Did your cattle have conjunctivitis in the last 12 months (July 31, 2018 – June 30, 2019)? <b>Seu gado teve conjuntivite nos últimos 12 meses (31 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                         | *Select only one option <b>Selecione apenas uma opção</b>                               |  |
| sc4_6_17_2\$3       | Who treated the cattle most of the time for this condition? <b>Quem tratou o gado a maior parte do tempo para essa condição?</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians <b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL</b><br><br>5 Livestock Technician <b>Técnico de Pecuária</b> | *Ask if sc4_6_17_1\$3 = 1<br>*Select all that apply <b>Selecione tudo que se aplica</b> |  |

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|                     | 6 Other <b>Outros</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                      |                                                                                         |  |
| sc4_6_17_2_OTHER\$3 | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                           | *Ask if sc4_6_17_2\$3 = 6                                                               |  |
| sc4_6_17_3\$3       | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantas vacas tiveram esta doença nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)?</b>                                                                                                                                                                                                                         | *Ask if sc4_6_17_1\$3 = 1<br>*Enter -99 if do not know/refuse to answer                 |  |
| sc4_6_17_1\$4       | Did your cattle have Tick-borne diseases (heartwater, readwater, anaplasmosis) in the last 12 months (July 31, 2018 – June 30, 2019)? <b>Seu gado teve doenças transmitidas por carrças (riquetsiose, babesiose, anaplasmoze) nos últimos 12 meses (31 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option <b>Selecione apenas uma opção</b>                               |  |
| sc4_6_17_2\$4       | Who treated the cattle most of the time for this condition? <b>Quem tratou o gado a maior parte do tempo para essa condição?</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians <b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL</b>                       | *Ask if sc4_6_17_1\$4 = 1<br>*Select all that apply <b>Selecione tudo que se aplica</b> |  |

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|                     | <p>5 Livestock Technician <b>Técnico de Pecuária</b></p> <p>6 Other <b>Outros</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                                                                                                                                                                                   |                                                                                                  |  |
| sc4_6_17_2_OTHER\$4 | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                            | *Ask if sc4_6_17_2\$4 = 6                                                                        |  |
| sc4_6_17_3\$4       | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantas vacas tiveram esta doença nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)?</b>                                                                                                                                                                                                                          | <p>*Ask if sc4_6_17_1\$4 = 1</p> <p>*Enter -99 if do not know/refuse to answer</p>               |  |
| sc4_6_17_1\$5       | <p>Did your cattle have diarrhoea in the last 12 months (July 31, 2018 – June 30, 2019)? <b>Seu gado teve diarreia nos últimos 12 meses (31 de julho de 2018 a 30 de junho de 2019)?</b></p> <p>1 Yes <b>Sim</b></p> <p>2 No <b>Nao</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                             | *Select only one option <b>Selecione apenas uma opção</b>                                        |  |
| sc4_6_17_2\$5       | <p>Who treated the cattle most of the time for this condition? <b>Quem tratou o gado a maior parte do tempo para essa condição?</b></p> <p>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b></p> <p>2 Promoter <b>Promotor</b></p> <p>3 Private contracted veterinarians <b>veterinários contratados</b></p> <p>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL</b></p> | <p>*Ask if sc4_6_17_1\$5=1</p> <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> |  |



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|                     | <p>5 Livestock Technician Técnico de Pecuária</p> <p>6 Other Outros</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                                                                                                                       |                                                                                    |  |
| sc4_6_17_2_OTHER\$5 | Other, please specify Outros ( por favor especifique)                                                                                                                                                                                                                                                                                                                                                                                  | *Ask if sc4_6_17_2\$5=6                                                            |  |
| sc4_6_17_3\$5       | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)? Quantas vacas tiveram esta doença nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)?                                                                                                                                                                                                                                                | <p>*Ask if sc4_6_17_1\$5 = 1</p> <p>*Enter -99 if do not know/refuse to answer</p> |  |
| sc4_6_17_1\$6       | <p>Other</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                                                                                                                                                                                                                                                                 | *Select only one option Selecione apenas uma opção                                 |  |
| sc4_6_17_1\$6_OUTRO | <p>Who treated the cattle most of the time for this condition? Quem tratou o gado a maior parte do tempo para essa condição?</p> <p>1 Household member or hired worker membro do agregado familiar ou trabalhador contratado</p> <p>2 Promoter Promotor</p> <p>3 Private contracted veterinarians veterinários contratados</p> <p>4 Project (e.g. LOL) Projeto (por exemplo, LOL</p> <p>5 Livestock Technician Técnico de Pecuária</p> | *Ask if sc4_6_17_1\$6 = 1                                                          |  |

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|                     | 6 Other <b>Outros</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                             |                                                                                   |                |
| sc4_6_17_2\$6       | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                  | *Ask if sc4_6_17_1\$6 = 1<br>*Select all that apply                               |                |
| sc4_6_17_2_OTHER\$6 | How many cows had this disease in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantas vacas tiveram esta doença nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)?</b>                                                                                                                                                                                                | *Ask if sc4_6_17_2\$6 = 6                                                         |                |
| sc4_6_17_3\$6       | Other<br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                      | *Ask if sc4_6_17_1\$6 = 1<br>*Enter -99 if do not know/refuse to answer           |                |
| sc4_6_18            | Were any of your lactating cows treated with injectable antibiotics in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Alguma de suas vacas em lactação foi tratada com antibióticos injetáveis nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option <b>Selecione apenas uma opção</b>                         |                |
| sc4_6_19            | Did you withhold their milk from human consumption or sale following treatment? <b>Você retirou o leite do consumo humano ou venda após o tratamento?</b>                                                                                                                                                                                                                                     | *Ask if sc4_6_18 = 1<br>*Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #10 |

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|             | 1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                                                                     |                                                                                     |  |
| Sc4_6_19_1  | For how many days did you withhold their milk from human consumption or sale following treatment? <b>Por quantos dias você reteve esse leite do consumo humano ou venda após o tratamento?</b>                                                                                                                                                                                                                                                                                      | *Ask if sc4_6_19=1<br>*Enter -99 if do not know/refuse to answer                    |  |
| sc4_7_1_1   | Have you used artificial insemination for your cows and heifers over the past 12 months (July 2018 – July 2019)? <b>Você usou inseminação artificial para suas vacas e novilhas nos últimos 12 meses (julho de 2018 - julho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                        | *Select only one option <b>Selecione apenas uma opção</b>                           |  |
| sc4_7_2_1_1 | Who provided the service? <b>Quem forneceu o serviço?</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians <b>veterinários contratados</b><br>4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL</b><br>5 Livestock Technician <b>Técnico de Pecuária</b><br>6 Other <b>Outros</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if sc4_7_1_1 = 1<br>*Select all that apply <b>Selecione tudo que se aplica</b> |  |

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| sc4_7_2_1_1_OUTRO | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | *Ask if sc4_7_2_1_1 = 6                                                             |                |
| sc4_7_3_12        | How easy or difficult was it for you to access artificial insemination for your dairy cattle? <b>Quão fácil ou difícil foi para você ter acesso à inseminação artificial para o seu gado leiteiro?</b><br>1 Very easy <b>Muito facil</b><br>2 In a way easy <b>De alguma forma facil</b><br>3 Neither easy nor difficult <b>Nem facil nem dificil</b><br>4 Somehow difficult <b>De alguma forma dificil</b><br>5 Very difficult <b>Muito dificil</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if sc4_7_1_1 = 1<br>*Select only one option <b>Selecione apenas uma opção</b>  | INDICATOR: #13 |
| sc4_7_1_2         | Have you used natural breeding services for your cows and heifers over the past 12 months (July 2018 – July 2019)? <b>Você usou serviços de monta natural (touro) para suas vacas e novilhas nos últimos 12 meses (julho de 2018 - julho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                        | *Select only one option <b>Selecione apenas uma opção</b>                           |                |
| sc4_7_2_1_2       | Who provided the service? <b>Quem forneceu o serviço</b><br>1 Household member or hired worker <b>membro do agregado familiar ou trabalhador contratado</b><br>2 Promoter <b>Promotor</b><br>3 Private contracted veterinarians <b>veterinários contratados</b>                                                                                                                                                                                                                                                                  | *Ask if sc4_7_1_2 = 1<br>*Select all that apply <b>Selecione tudo que se aplica</b> |                |

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|                   | 4 Project (e.g. LOL) <b>Projeto (por exemplo, LOL)</b><br>5 Livestock Technician <b>Técnico de Pecuária</b><br>6 Other <b>Outros</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                                                                                                                                                                                                                                                                                                                 |                                                                                    |                |
| sc4_7_2_1_2_OUTRO | Other, please specify <b>Outros ( por favor especifique)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | *Ask if sc4_7_2_1_2 = 6                                                            |                |
| sc4_7_3_22        | How easy or difficult was it for you to access artificial insemination for your dairy cattle? <b>Quão fácil ou difícil foi para você ter acesso à inseminação artificial para o seu gado leiteiro?</b><br>1 Very easy <b>Muito facil</b><br>2 In a way easy <b>De alguma forma facil</b><br>3 Neither easy nor difficult <b>Nem facil nem dificil</b><br>4 Somehow difficult <b>De alguma forma dificil</b><br>5 Very difficult <b>Muito dificil</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Ask if sc4_7_1_2 = 1<br>*Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #13 |
| Sc4_8_0           | If you wanted to buy a heifer for dairy production, how easy or difficult would it be? <b>Se você quisesse comprar uma novilha para a produção de leite, quão fácil ou difícil seria?</b><br>1 Very easy <b>Muito facil</b><br>2 In a way easy <b>De alguma forma facil</b><br>3 Neither easy nor difficult <b>Nem facil nem dificil</b><br>4 Somehow difficult <b>De alguma forma dificil</b><br>5 Very difficult <b>Muito dificil</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>              | *Select only one option <b>Selecione apenas uma opção</b>                          | INDICATOR: #13 |

|                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                           |                |
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| sc4_8_1                                                                                                                                                                                           | <p>In general, how easy or difficult is it to access health services for your dairy cattle? Em geral, quão difícil é ter acesso aos serviços de saúde para o gado leiteiro?</p> <p>1 Very easy <b>Muito facil</b><br/> 2 In a way easy <b>De alguma forma facil</b><br/> 3 Neither easy nor difficult <b>Nem facil nem dificil</b><br/> 4 Somehow difficult <b>De alguma forma dificil</b><br/> 5 Very difficult <b>Muito dificil</b><br/> -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p>                                                                                  | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #13 |
| <p><b>[Transition]:</b> Enumerator: Now I'd like to ask you about your inputs and from where you receive them <b>Agora gostaria de perguntar sobre suas entradas e de onde você as recebe</b></p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                           |                |
| Sc7_5                                                                                                                                                                                             | <p>In the last 12 months (July 1, 2018 – June 30, 2019) Did you receive any dairy inputs or services (e.g food and feed supplements, medicines, veterinary care etc.) from the Land O'Lakes MERCADO project? Nos últimos 12 meses (1º de julho de 2018 - 30 de junho de 2019) <b>Você recebeu algum insumo e serviços para o gado leiteiro (por exemplo, suplementos alimentares e de rações, remédios, cuidados veterinários, etc.) do projeto Land O'Lakes MERCADO?</b></p> <p>1 Yes <b>Sim</b><br/> 2 No <b>Nao</b><br/> -99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b></p> | *Select only one option <b>Selecione apenas uma opção</b> |                |
| sc7_6                                                                                                                                                                                             | <p>In the last 12 months (July 1, 2018 – June 30, 2019), Did you receive any dairy inputs or services from a buyer? <b>Nos últimos 12 meses (1º de julho de 2018 - 30 de junho de 2019), você recebeu algum insumo ou</b></p>                                                                                                                                                                                                                                                                                                                                                                            | *Select only one option <b>Selecione apenas uma opção</b> |                |

|               |                                                                                                                                                                                               |                                                                                    |  |
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|               | <p>serviço para o gado leiteiro de um comprador de leite?</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                       |                                                                                    |  |
| sc7_7_1       | <p>Milk Collection Center / Cooperative Centro de Coleta de Leite / Cooperativa</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p> | <p>*Ask if sc7_6 = 1</p> <p>*Select only one option Selecione apenas uma opção</p> |  |
| sc7_7_2       | <p>Local Buyer Comprador local</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                  | <p>*Ask if sc7_6 = 1</p> <p>*Select only one option Selecione apenas uma opção</p> |  |
| sc7_7_3       | <p>Processor Processador</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                        | <p>*Ask if sc7_6 = 1</p> <p>*Select only one option Selecione apenas uma opção</p> |  |
| sc7_7_4       | <p>Other Outros</p> <p>1 Yes Sim</p> <p>2 No Nao</p> <p>-99 Do not know/refuse to answer Não sabe / recusa-se a responder</p>                                                                 | <p>*Ask if sc7_6 = 1</p> <p>*Select only one option Selecione apenas uma opção</p> |  |
| sc7_7_4_OTHER | Other, please specify Outros ( por favor especifique)                                                                                                                                         | *Ask if sc7_7_4 = 1                                                                |  |
|               | <p>What specific inputs have you received from a buyer in the last 12 months? Que insumos específicos você recebeu de um comprador nos últimos 12 meses?</p>                                  | *Ask if sc7_6 = 1                                                                  |  |

|          |                                                                                                                                                           |                                                    |  |
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| sc7_10_1 | Food & Feed Supplements Alimentos e Suplementos Alimentares<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder | *Select only one option Selecione apenas uma opção |  |
| sc7_10_2 | Medicines Medicamentos<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                      | *Select only one option Selecione apenas uma opção |  |
| sc7_10_3 | Veterinary care Cuidados veterinários<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                       | *Select only one option Selecione apenas uma opção |  |
| sc7_10_4 | Milk test Teste de leite<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                    | *Select only one option Selecione apenas uma opção |  |
| sc7_10_5 | Artificial insemination Inseminação artificial<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder              | *Select only one option Selecione apenas uma opção |  |
| sc7_10_6 | Village bull of the community Touro da comunidade<br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder           | *Select only one option Selecione apenas uma opção |  |



|                |                                                                                                                                                                    |                                                           |  |
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| sc7_10_7       | Milking utensils <b>Utensílios de ordenha</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>   | *Select only one option <b>Selecione apenas uma opção</b> |  |
| sc7_10_8       | Continuing training <b>Treinamento contínuo</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b> | *Select only one option <b>Selecione apenas uma opção</b> |  |
| sc7_10_9       | Other <b>Outros</b><br>1 Yes <b>Sim</b><br>2 No <b>Nao</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa-se a responder</b>                             | *Select only one option <b>Selecione apenas uma opção</b> |  |
| sc7_10_9_OTHER | Other (Specify) <b>Outro especificar)</b>                                                                                                                          | *Ask if sc7_10_9 = 1                                      |  |

## SECTION 5: TRAINING AND KNOWLEDGE

**[Transition]:** Enumerator: Now I would like to talk to you about any training you may have received. *Agora gostaria de falar com você sobre qualquer treinamento que você tenha recebido.*

| VARIABLES | TRAINING AND KNOWLEDGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ENUMERATOR INSTRUCTIONS                                                                                                                                          | PMP INDICATORS |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| sc10_1    | <p>Are you aware of the MERCADO project led by Land O'Lakes? <i>Você está ciente do projeto MERCADO liderado pela Land O'Lakes?</i></p> <p>1 Yes <i>Sim</i></p> <p>2 No <i>Nao</i></p> <p>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>*Select only one option <i>Selecione apenas uma opção</i></p> <p>*If sc10_1 = 2, go to sc5_1</p>                                                              |                |
| sc10_2    | <p>What kind of engagement have you had with MERCADO since October 2016? <i>Que tipo de envolvimento você tem com a MERCADO desde outubro de 2016?</i></p> <p>1 Received trainings <i>Tive treinamentos</i></p> <p>2 Been connected to input suppliers <i>Fui conectado aos fornecedores de insumos</i></p> <p>3 Been connected to buyers and exporters <i>Fui conectado a compradores e exportadores</i></p> <p>4 Received inputs directly <i>recebi insumos diretamente</i></p> <p>5 Become part of a dairy cooperativerative <i>Tornei-me parte de uma cooperativa de leite</i></p> <p>6 Other, Specify <i>Outro, Especifique</i></p> <p>-99 Do not know/refuse to <i>Não sabe / recusa-se a responder</i></p> | <p>*Prompt with options <i>sugirir opcoes</i></p> <p>*Select all that apply <i>Selecione tudo que se aplica</i></p> <p>*Ask if sc10_1 = 1 else skip to sc5_1</p> |                |
|           | <p>Please rate the following as "Not Useful," "Little Useful," "Somewhat useful" or "Very Useful": <i>Por favor, avalie o</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                  |                |

|        |                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                             |  |
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|        | seguinte como "Não útil", "Pouco útil", "Um pouco útil" ou "Muito útil":                                                                                                                                                                                                                                                                                                          |                                                                                             |  |
| sc10_5 | <p>Trainings on dairy production: <b>Treinamentos sobre produção de laticínios:</b></p> <p>1 Very Useful <b> muito útil</b></p> <p>2 Somewhat useful <b> Um pouco útil</b></p> <p>3 Little useful <b> pouco útil</b></p> <p>4 Not useful <b> Não é útil</b></p> <p>-99 Do not know/refuse to answer <b> Não sei / recuso-me a responder</b></p>                                   | <p>*Ask if sc10_2 = 1</p> <p>*Select only one option <b> Selecione apenas uma opção</b></p> |  |
| sc10_6 | <p>Establishing connection to input suppliers <b> Estabelecendo conexão para fornecedores de insumos</b></p> <p>1 Very Useful <b> muito útil</b></p> <p>2 Somewhat useful <b> Um pouco útil</b></p> <p>3 Little useful <b> pouco útil</b></p> <p>4 Not useful <b> Não é útil</b></p> <p>-99 Do not know/refuse to answer <b> Não sabe / recusa-se a responder</b></p>             | <p>*Select only one option <b> Selecione apenas uma opção</b></p> <p>*Ask if sc10_2 = 2</p> |  |
| sc10_7 | <p>Establishing connection to buyers and exporters <b> Estabelecimento de conexão com compradores e exportadores</b></p> <p>1 Very Useful <b> muito útil</b></p> <p>2 Somewhat useful <b> Um pouco útil</b></p> <p>3 Little useful <b> pouco útil</b></p> <p>4 Not useful <b> Não é útil</b></p> <p>-99 Do not know/refuse to answer <b> Não sabe / recusa-se a responder</b></p> | <p>*Ask if sc10_2 = 3</p> <p>*Select only one option <b> Selecione apenas uma opção</b></p> |  |
| sc10_8 | <p>Receiving dairy inputs directly <b> Recebendo insumos para o gado leite diretamente</b></p> <p>1 Very Useful <b> muito útil</b></p> <p>2 Somewhat useful <b> Um pouco útil</b></p>                                                                                                                                                                                             | <p>*Select only one option <b> Selecione apenas uma opção</b></p> <p>*Ask if sc10_2 = 4</p> |  |

|           |                                                                                                                                                                                                                                                            |                                                                              |  |
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|           | 3 Little useful pouco útil<br>4 Not useful Não é útil<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                                                                                 |                                                                              |  |
| sc10_10   | 1 Very Useful muito útil<br>2 Somewhat useful Um pouco útil<br>3 Little useful pouco útil<br>4 Not useful Não é útil<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                  | *Select only one option Selecione apenas uma opção<br><br>*Ask if sc10_2 = 5 |  |
| Sc10_11   | Have you previously worked with any project supporting the dairy industry? Você já trabalhou anteriormente com algum projeto de apoio à produção de leites ?<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer Não sabe / recusa-se a responder | *Select only one option Selecione apenas uma opção                           |  |
|           | Which organization have you worked with? Com que organização você trabalhou?                                                                                                                                                                               | *Ask if sc10_11 = 1                                                          |  |
| Sc10_11_1 | Belgian (specify name) Belga (especificar nome)<br>1 Yes Sim<br>2 No Não                                                                                                                                                                                   | *Ask if sc10_11=1<br>*Select only one option                                 |  |
| Sc10_11_2 | German (specify name) Alemão (especificar nome)<br>1 Yes Sim<br>2 No Não                                                                                                                                                                                   | *Ask if sc10_11=1<br>*Select only one option                                 |  |
| Sc10_11_3 | Mozambican government (specify name) Governo moçambicano (especificar nome)<br>1 Yes Sim<br>2 No Não                                                                                                                                                       | *Ask if sc10_11=1<br>*Select only one option                                 |  |
| Sc10_11_4 | Land O Lakes<br>1 Yes Sim                                                                                                                                                                                                                                  | *Ask if sc10_11=1<br>*Select only one option                                 |  |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                 |  |
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|           | 2 No Não                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                 |  |
| Sc10_11_4 | Other (specify name)<br>1 Yes Sim<br>2 No Não                                                                                                                                                                                                                                                                                                                                                                                                              | *Ask if sc10_11=1<br>*Select only one option                                    |  |
| sc5_1     | Has anyone in your household or an employee received Land O'Lakes/MERCADO training in dairy cattle management in the last 12 months (July 1, 2018 – June 30, 2019)? <i>Alguém em sua casa ou empregado recebeu treinamento da Land O'Lakes / MERCADO em manejo de gado leiteiro nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</i><br>1 Yes Sim<br>2 No Nao<br>-99 Do not know/refuse to answer <i>Não sabe / recusa-se a responder</i> | *Ask if sc10_2 = 1<br>*Select only one option                                   |  |
| Sc5_1_1   | What kind of trainings have you received?<br>e <i>Que tipo de treinamentos você recebeu?</i><br>1 Training on improved farm practices <i>Treinamento em melhores práticas agrícolas</i><br>2 Fodder production <i>Produção de forragem</i><br>3 Other, specify <i>Outro, especifique</i><br>-99 Do not know/refuse to answer <i>Não sei / recuso-me a responder</i>                                                                                        | *Ask if sc5_1 = 1<br>*Select all that apply <i>Selecione tudo que se aplica</i> |  |
| sc5_2     | Who has received this training? <i>Quem recebeu este treinamento</i><br>1 Repondent <i>Entrevistado</i><br>2 Respondent's spouse <i>Esposo/a do entrevistado</i><br>3 Another adult male member of the household <i>Outro membro masculino adulto do agregado familiar</i>                                                                                                                                                                                 | *Ask if sc5_1 = 1<br>*Select only one option <i>Selecione apenas uma opção</i>  |  |

|                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                             |                                    |
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|                                                                                                                                                                                                                    | 4 Other household adult female member of the household <b>Outro membro feminino do agregado familiar do agregado familiar</b><br>5 Farm employee <b>funcionário da farma</b><br>6 Other <b>Outro</b><br>-99 Do not know/refuse to answer <b>Não sei / recuso-me a responder</b>                                                                                                                                                                                                                                          |                                                             |                                    |
| sc5_3                                                                                                                                                                                                              | Second party to receive training <b>Segunda parte a receber treinamento</b><br>1 Repondent <b>O Entrevistado</b><br>2 Respondent's spouse <b>Esposo/a do entrevistado</b><br>3 Another adult male member of the household <b>Esposo/a do entrevistado</b><br>4 Other household adult female member of the household <b>Outro membro da família: Adulto Feminino</b><br>5 Farm employee <b>Funcionário da fazenda</b><br>6 Other <b>Outros</b><br>-99 Do not know/refuse to answer <b>Não sei / recuso-me a responder</b> | *Ask if sc5_1 = 1<br>*Select only one option                |                                    |
| <b>[Transition]</b> : Enumerator: Now we want to ask you some questions about what you have learned <b>Entrevistador: Agora queremos fazer algumas perguntas sobre o que você aprendeu (sentença de transição)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                             |                                    |
|                                                                                                                                                                                                                    | What are two activities that you can do to improve pasture quality? <b>Quais são as duas atividades que você pode fazer para melhorar a qualidade das pastagens?</b>                                                                                                                                                                                                                                                                                                                                                     | *Do not prompt with options <b>Não aadiantar com opções</b> |                                    |
| sc5_4_1                                                                                                                                                                                                            | Controlling the weeds <b>Controlo de ervas daninhas</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                                                                                                                                                                                                                                                                                                           | *Select only one option <b>Selecione apenas uma opção</b>   | INDICATOR: #17<br><b>INDICADOR</b> |

|         |                                                                                                                                                                                                                    |                                                             |                                    |
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| sc5_4_2 | Fertilize the field with potassium once a year (if the field has a sandy soil) <b>Fertilização do campo com potássio uma vez por ano (se o campo tiver um solo arenoso)</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b> | *Select only one option <b>Selecione apenas uma opção</b>   | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_4_3 | Rotate between grass and vegetables <b>Rotação entre capim e hortícolas</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                 | *Select only one option <b>Selecione apenas uma opção</b>   | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_4_4 | Seal the field to eliminate entry of unwanted animals <b>Cercar o campo para eliminar a entrada de animais indesejados</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                  | *Select only one option <b>Selecione apenas uma opção</b>   | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_4_5 | Cut the grass (with a scythe, animal scythe or reaper) <b>Cortar o capim (com uma foice, foice animal ou ceifeira)</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                      | *Select only one option <b>Selecione apenas uma opção</b>   | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_4_6 | Other <b>Outro</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                                          | *Select only one option <b>Selecione apenas uma opção</b>   |                                    |
|         | Please list the advantages of artificial insemination <b>Por favor, liste as vantagens da inseminação artificial</b>                                                                                               | *Do not prompt with options <b>Não aadiantar com opções</b> |                                    |
| sc5_5_1 | No need to have access to an ox / male / bull <b>Não há necessidade de ter acesso a um boi / macho / touro</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                              | *Select only one option <b>Selecione apenas uma opção</b>   | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_5_2 | No risk of transmission of sickness <b>Nenhum risco de transmissão de doença</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                            | *Select only one option <b>Selecione apenas uma opção</b>   | INDICATOR: #17<br><b>INDICADOR</b> |

|               |                                                                                                                                                                                                                                                                              |                                                           |                                    |
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| sc5_5_3       | The offspring will have predictable genetic material <b>A cria terá material genético previsível</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                  | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_5_4       | Having power to decide when and what you want your cows to achieve <b>Ter poder para decidir quando e o que você quer que suas vacas alcancem</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                     | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_5_5       | It is more economical to buy semen than to keep an ox / male / bull <b>É mais econômico comprar sêmen do que manter um boi / macho / touro</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                        | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR #17<br><b>INDICADOR</b>  |
| sc5_5_6       | You can choose from males from all over the world, depending on the characteristics you need for your herd <b>Você pode escolher entre machos de todo o mundo, dependendo das características que você precisa para o seu rebanho</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b> | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_5_7       | Other <b>Outro</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                                                                                                    | *Select only one option <b>Selecione apenas uma opção</b> |                                    |
| sc5_5_7_OUTRO | Other, please specify <b>Outro (por favor, especifique</b>                                                                                                                                                                                                                   | *Ask if sc5_5_7 = 1                                       |                                    |
|               | What data or information would you need to estimate the profit from your dairy business                                                                                                                                                                                      | *Do not prompt with options                               |                                    |



|               |                                                                                                                                                                                          |                                                               |                                    |
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| sc5_6_1       | What data or information would you need to estimate the profit from your dairy business <b>Quais dados ou informações você precisaria para estimar o lucro de seu negócio de leite ?</b> | *Do not prompt with options<br><b>Não adiantar com opções</b> |                                    |
| sc5_6_2       | Revenue <b>receita</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                            | *Select only one option<br><b>Selecione apenas uma opção</b>  | INDICATOR: #18<br><b>INDICADOR</b> |
| sc5_6_3       | Expenses <b>Despesas</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                          | *Select only one option<br><b>Selecione apenas uma opção</b>  | INDICATOR: #18<br><b>INDICADOR</b> |
| sc5_6_3_OUTRO | Other <b>Outro</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                | *Select only one option<br><b>Selecione apenas uma opção</b>  |                                    |
|               | Other, please specify <b>Outro (por favor, especifique</b>                                                                                                                               | *Ask if sc5_6_3 = 1                                           |                                    |
| sc5_7_1       | What are the most important equipment or areas to have in the Kraal <b>Quais são os equipamentos ou áreas mais importantes para se ter no curral</b>                                     | *Do not prompt with options<br><b>Não adiantar com opções</b> |                                    |
| sc5_7_2       | Feeder / food receptacle <b>Alimentador / Comedouros</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                          | *Select only one option<br><b>Selecione apenas uma opção</b>  | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_7_3       | Water cooler / water receptacle <b>Refrigerador de água / bebedouro</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                           | *Select only one option<br><b>Selecione apenas uma opção</b>  | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_7_4       | Sheet / cover to give shade <b>Chapa / cobertura para dar sombra</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                              | *Select only one option<br><b>Selecione apenas uma opção</b>  | INDICATOR: #17<br><b>INDICADOR</b> |
| sc5_7_5       | Cement in the milking area <b>Cimento na área de ordenha</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                      | *Select only one option <b>Selecione apenas uma opção</b>     | INDICATOR: #17<br><b>INDICADOR</b> |

|         |                                                                                                                                                                                                                                |                                                           |                |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------|
|         | Please provide us with ways of preventing or controlling mastitis <b>Por favor, indique maneiras de prevenir ou controlar a mastite</b>                                                                                        | *Do not prompt with options                               |                |
| sc5_8_1 | Disinfect the udder and teats before milking <b>Desinfecte o úbere e as tetas antes de ordenha</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                      | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17 |
| sc5_8_2 | Keep milking equipment clean and in good condition <b>Mantenha o equipamento de ordenha limpo e em boas condições</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                   | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17 |
| sc5_8_3 | Wash hands before and after milking each cow <b>Lave as mãos antes e depois da ordenha de cada vaca</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                 | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17 |
| sc5_8_4 | Disinfecting the udder and teats after milking <b>Desinfecção do úbere e tetas após a ordenha</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                       | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17 |
| sc5_8_5 | Feed the cows immediately after milking, and ensure they have access to clean water <b>Alimente as vacas imediatamente após a ordenha e garanta que elas tenham acesso a água limpa</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b> | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17 |
| sc5_8_6 | Treat mastitis using veterinary products or services <b>Tratar mastite usando produtos ou serviços veterinários</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                     | *Select only one option <b>Selecione apenas uma opção</b> | INDICATOR: #17 |

|                |                                                                                                                                                                                                                                                                         |                                                                                                                          |                |
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| sc5_8_7        | Keep cows that frequently suffer from mastitis away from other <b>Mantenha as vacas que freqüentemente sofrem de mastite longe de outras</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                     | *Select only one option <b>Selecione apenas uma opção</b>                                                                | INDICATOR: #17 |
| sc5_8_8        | Milking the cows with mastitis after the other cows <b>Ordenhando as vacas com mastite após as outras vacas</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                  | *Select only one option <b>Selecione apenas uma opção</b>                                                                | INDICATOR: #17 |
| sc5_8_9        | Keep cows as clean as possible <b>Mantenha as vacas o mais limpas possível</b><br>1 Yes<br>2 No                                                                                                                                                                         | *Select only one option <b>Selecione apenas uma opção</b>                                                                | INDICATOR: #17 |
| sc5_8_10       | Give dry cow therapy to dry cows <b>Dê tratamento de vaca seca para vacas secas</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                              | *Select only one option <b>Selecione apenas uma opção</b>                                                                | INDICATOR: #17 |
| sc5_8_11       | Keep the Kraal and place of the cleaned calf <b>Mantenha o Kraal e o lugar do vitelo limpos</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                  | *Select only one option <b>Selecione apenas uma opção</b>                                                                | INDICATOR: #17 |
| sc5_8_12       | Other <b>Outros</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                                                                                              | *Select only one option <b>Selecione apenas uma opção</b>                                                                |                |
| sc5_8_12_OUTRO | Other (Specify) <b>Outro especifique)</b>                                                                                                                                                                                                                               | *Ask of sc5_8_12=1                                                                                                       |                |
| Sc5_10_1       | What are best practices in cow feeding? <b>Quais são as melhores práticas na alimentação de vacas?</b><br>1 Adequate grass for grazing pastagem <b>adequada</b><br>2 Mineral supplementation <b>suplementação mineral</b><br>3 Fodder/forage <b>forragem / forragem</b> | *Do not prompt with options <b>Não adiantar com opções</b><br>*Select all that apply <b>Selecione tudo que se aplica</b> | INDICATOR: #17 |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                     |                |
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|          | <p>4 Continuous access to water <b>Acesso contínuo à água</b></p> <p>5 Other, specify <b>Outro especifique)</b></p> <p>-99 Do not know/refuse to answer <b>Não sei / recuso-me a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                     |                |
| Sc5_10_2 | <p>What are the advantages of keeping the kraal hygienic? <b>Quais são as vantagens de manter o curral higienico?</b></p> <p>1 Milk will not get contaminated <b>Leite não será contaminado</b></p> <p>2 Animal will be less susceptible to diseases <b>Animal será menos suscetível a doenças</b></p> <p>3 Other, specify <b>Outro especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sei / recuso-me a responder</b></p>                                                                                                                                                                      | <p>*Do not prompt with options <b>Não adiantar com opções</b></p> <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> | INDICATOR: #17 |
| Sc5_10_3 | <p>In what ways can the quality of milk be maintained? <b>De que maneiras a qualidade do leite pode ser mantida?</b></p> <p>1 Maintain a hygienic kraal <b>Manter um curral higiênico</b></p> <p>2 Weekly tick treatments <b>tratamentos semanais de carraças</b></p> <p>3 Vaccinations <b>Vacinações</b></p> <p>4 Use of steel receptacles for milk <b>Uso de recipientes de aço para leite</b></p> <p>5 Use of a milking machine <b>Uso de uma máquina de ordenha</b></p> <p>6 Other, specify <b>Outro especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sei / recuso-me a responder</b></p> | <p>*Do not prompt with options <b>Não adiantar com opções</b></p> <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> | INDICATOR: #17 |
| Sc5_10_4 | <p>Do you currently create a budget for farm operations? <b>Atualmente você estabelece um orçamento para operações da farma?</b></p> <p>1 Yes <b>Sim</b></p> <p>2 No <b>Nao</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>*Do not prompt with options <b>Não adiantar com opções</b></p> <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> | INDICATOR: #18 |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                        |                |
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|          | -99 Do not know/refuse to answer Não sabe / recusa-se a responder                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                        |                |
| Sc5_10_5 | <p>What are the contents of a business plan? Quais são os conteúdos de um plano de negócios</p> <ol style="list-style-type: none"> <li>1 Financial plan plano financeiro</li> <li>2 Breakdown of products and services Discriminação de produtos e serviços</li> <li>3 Production plan plano de produção</li> <li>4 Sales plan plano de vendas</li> <li>5 Other, specify Outro especifique</li> </ol> <p>-99 Do not know/refuse to answer Não sei / recuso-me a responder</p>                                                                                              | <p>**Do not prompt with options Não adiantar com opções</p> <p>*Select all that apply Selecione tudo que se aplica</p> | INDICATOR: #18 |
| Sc5_10_6 | <p>What types of record should a dairy farmer keep? Que tipos de registro um produtor deve manter?</p> <ol style="list-style-type: none"> <li>1 Production records registros de produção</li> <li>2 Feeding records registros de alimentação</li> <li>3 Sales records registros de vendas</li> <li>4 Calving records registros de parto</li> <li>5 Health records registros de saúde</li> <li>6 Mortality records registros de mortalidade</li> <li>7 Other, specify Outro, especifique</li> </ol> <p>-99 Do not know/refuse to answer Não sei / recuso-me a responder</p> | <p>*Do not prompt with options Não adiantar com opções</p> <p>*Select all that apply Selecione tudo que se aplica</p>  | INDICATOR: #18 |

## SECTION 6: LABOR, ROLES, AND RESPONSIBILITIES

**[Transition]:** Enumerator: Now I want to talk to you about the labor employed by you and the division of labor on your farm.  
 Agora quero falar consigo acerca dos trabalhadores empregues e da divisão do trabalho na sua farma

| VARIABLES        | LABOR, ROLES AND RESPONSIBILITIES                                                                                                                                                                                                                         | ENUMERATOR INSTRUCTIONS                                                                                                                              | PMP INDICATOR |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                  | In the past 12 months, how many employees of the different types did you have for dairy activities or fodder production <b>Nos últimos 12 meses, quantos empregados dos diferentes tipos você teve para atividades leiteiras ou produção de forragem?</b> | *Please enter 0 if did not use<br><b>Por favor digite 0 se não usou</b>                                                                              |               |
| sc6_3_1_1_MALE   | Full time permanent – Male <b>Tempo inteiro permanente - Masculino</b>                                                                                                                                                                                    | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / ou se recusa a responder</b>                                                  | INDICATOR: #3 |
| sc6_3_1_1_FEMALE | Full-time permanent – Female <b>Tempo inteiro permanente - feminino</b>                                                                                                                                                                                   | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe/ ou se recusa a responder</b>                                                   | INDICATOR: #3 |
| sc6_3_1_2_MALE   | Part Time Permanent – Male <b>Meio período permanente - masculino</b>                                                                                                                                                                                     | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não souber / se recusar a responder Digite -99 se não sabe/ ou se recusa a responder</b> | INDICATOR: #3 |
| sc6_3_1_2_FEMALE | Part time permanent – Female <b>Meio período permanente - feminino</b>                                                                                                                                                                                    | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe/ ou se recusa a responder</b>                                                   | INDICATOR: #3 |

|                  |                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                               |               |
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| sc6_3_1_3_MALE   | Full-time seasonal – Male <b>Tempo inteiro sazonal- Masculino</b>                                                                                                                                                                                                                                                                                             | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe/ ou se recusa a responder</b>                                                                                                                                                                                                                                                            | INDICATOR: #3 |
| sc6_3_1_3_FEMALE | Full-time seasonal- Female <b>Tempo inteiro sazonal- Feminino</b>                                                                                                                                                                                                                                                                                             | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe/ ou se recusa a responder</b>                                                                                                                                                                                                                                                            | INDICATOR: #3 |
| sc6_3_1_4_MALE   | Part Time seasonal – Male <b>meio period sazonal-masculino</b>                                                                                                                                                                                                                                                                                                | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe/ ou se recusa a responder</b>                                                                                                                                                                                                                                                            | INDICATOR: #3 |
| sc6_3_1_4_FEMALE | Part Time seasonal – Female <b>meio período sazonal - feminino</b>                                                                                                                                                                                                                                                                                            | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe/ ou se recusa a responder</b>                                                                                                                                                                                                                                                            | INDICATOR: #3 |
|                  | How many new employees for each of the following types (from variables sc6_31_1_1_MALE to sc6_31_1_4_FEMALE), did you hire in the past 12 months as a result of participation in the MERCADO project?<br><b>Quantos novos funcionários para cada um dos seguintes tipos contratou nos últimos 12 meses como resultado da participação no projeto MERCADO?</b> | How many new employees for each of the following types (from variables sc6_31_1_1_MALE to sc6_31_1_4_FEMALE), did you hire in the past 12 months as a result of participation in the MERCADO project?<br><b>Quantos novos funcionários para cada um dos seguintes tipos contratou nos últimos 12 meses como resultado da participação no projeto MERCADO?</b> |               |

|                   |                                                                                                                                                        |                                                                                                    |               |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------|
| sc6_31_1_1_MALE   | Full time permanent - Male <b>Tempo inteiro permanente - Masculino</b>                                                                                 | Full time permanent - Male <b>Tempo inteiro permanente - Masculino</b>                             | INDICATOR: #3 |
| sc6_31_1_1_FEMALE | Full-time permanent – Female <b>Tempo inteiro permanente - feminino</b>                                                                                | Full-time permanent – Female <b>Tempo inteiro permanente - feminino</b>                            | INDICATOR: #3 |
| sc6_31_1_2_MALE   | Part Time Permanent – Male <b>Meio período permanente - masculino</b>                                                                                  | Part Time Permanent – Male <b>Meio período permanente - masculino</b>                              | INDICATOR: #3 |
| sc6_31_1_2_FEMALE | Part time permanent – Female <b>Meio período permanente - masculino</b>                                                                                | Part time permanent – Female <b>Meio período permanente - masculino</b>                            | INDICATOR: #3 |
| sc6_31_1_3_MALE   | Full-time seasonal – Male <b>Tempo inteiro sazonal- Masculino</b>                                                                                      | Full-time seasonal – Male <b>Tempo inteiro sazonal- Masculino</b>                                  | INDICATOR: #3 |
| sc6_31_1_3_FEMALE | Full-time seasonal- Female <b>Tempo inteiro sazonal- Feminino</b>                                                                                      | Full-time seasonal- Female <b>Tempo inteiro sazonal- Feminino</b>                                  | INDICATOR: #3 |
| sc6_31_1_4_MALE   | Seasonal - Part Time – Male <b>Sazonal- meio period- masculino</b>                                                                                     | Seasonal - Part Time – Male <b>Sazonal- meio period- masculino</b>                                 | INDICATOR: #3 |
| sc6_31_1_4_FEMALE | Seasonal Part Time – Female <b>Tempo inteiro sazonal- Feminino</b>                                                                                     | Seasonal Part Time – Female <b>Tempo inteiro sazonal- Feminino</b>                                 | INDICATOR: #3 |
| sc6_3_2           | On average, how many hours per week does a part-time employee work? <b>Em média, quantas horas por semana um funcionário de meio período trabalha?</b> | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe/ ou se recusa a responder</b> |               |
| sc6_3_3_1         | On average, how many weeks of the year does a seasonal worker work? <b>Em média, quantas semanas do ano um trabalhador sazonal trabalha?</b>           | *Enter -99 if Do not know/refuse to answer <b>Digite</b>                                           |               |



|                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                           |  |
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|                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                        | -99 se não sabe/ ou se recusa a responder |  |
| [Transition]: Enumerator: Now we would like to ask you about the division of labor on your farm Agora queria perguntar sobre a divisão do trabalho na sua farma |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                           |  |
|                                                                                                                                                                 | Who is primarily responsible for doing the following activities in your dairy production? Quem é o principal responsável por realizar as seguintes atividades na sua produção de leite?                                                                                                                                                                                                                                | *Read out all options                     |  |
| sc6_3_4_1                                                                                                                                                       | Fodder production (sowing or planting) Produção de forragem (semear ou plantio)<br>1 Adult household man Homem adulto doméstico<br>2 Adult household woman Mulher adulto doméstico<br>3 Boys Rapazes<br>4 Girls Meninas<br>5 Paid worker trabalhador renumerado<br>6 Nobody does/Activity not performed Ninguém faz / atividade não executada<br>-99 Do not know/refuse to answer -99 Não sabe / se recusa a responder | *Select all that apply                    |  |
| sc6_3_4_2                                                                                                                                                       | Cleaning the kraal Limpar o curral<br>1 Adult household man Homem adulto doméstico<br>2 Adult household woman Mulher adulto doméstico<br>3 Boys Rapazes<br>4 Girls Meninas<br>5 Paid worker trabalhador renumerado<br>6 Nobody does/Activity not performed Ninguém faz / atividade não executada<br>-99 Do not know/refuse to answer -99 Não sabe / se recusa a responder                                              | *Select all that apply                    |  |
| sc6_3_4_3                                                                                                                                                       | Kraal building Construção do curral<br>1 Adult household man Homem adulto doméstico                                                                                                                                                                                                                                                                                                                                    | *Select all that apply                    |  |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |  |
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|           | 2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b>                                                                                                                                                                        |                        |  |
| sc6_3_4_4 | Purchase of products for cows (ration, medicines) <b>Compra de produtos para vacas (ração, medicamentos)</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b> | *Select all that apply |  |
| sc6_3_4_5 | Kraal maintenance <b>Manutenção do curral</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b>                                                                | *Select all that apply |  |
| sc6_3_4_6 | Cuts and takes fodder to the Kraal <b>Cortar e levar forragem para o Kraal</b>                                                                                                                                                                                                                                                                                                                                                                                                                       | *Select all that apply |  |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |  |
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|           | 1 Adult household man Homem adulto doméstico<br>2 Adult household woman Mulher adulto doméstico<br>3 Boys Rapazes<br>4 Girls Meninas<br>5 Paid worker trabalhador renumerado<br>6 Nobody does/Activity not performed Ninguém faz / atividade não executada<br>-99 Do not know/refuse to answer -99 Não sabe / se recusa a responder                                                                                                      |                        |  |
| sc6_3_4_7 | Cut fodder so the animals can eat Corte (triturar ou picar) da forragem para que os animais comam<br>1 Adult household man Homem adulto doméstico<br>2 Adult household woman Mulher adulto doméstico<br>3 Boys Rapazes<br>4 Girls Meninas<br>5 Paid worker trabalhador renumerado<br>6 Nobody does/Activity not performed Ninguém faz / atividade não executada<br>-99 Do not know/refuse to answer -99 Não sabe / se recusa a responder | *Select all that apply |  |
| sc6_3_4_8 | Transport of milk to the cooperative Transporte de leite para a cooperativa<br>1 Adult household man Homem adulto doméstico<br>2 Adult household woman Mulher adulto doméstico<br>3 Boys Rapazes<br>4 Girls Meninas<br>5 Paid worker trabalhador renumerado<br>6 Nobody does/Activity not performed Ninguém faz / atividade não executada<br>-99 Do not know/refuse to answer -99 Não sabe / se recusa a responder                       | *Select all that apply |  |

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                        |  |
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| sc6_3_4_9  | <p>Take the animals for grazing and water points <b>Levar os animais para pastar e pontos de água</b></p> <p>1 Adult household man <b>Homem adulto doméstico</b></p> <p>2 Adult household woman <b>Mulher adulto doméstico</b></p> <p>3 Boys <b>Rapazes</b></p> <p>4 Girls <b>Meninas</b></p> <p>5 Paid worker <b>trabalhador renumerado</b></p> <p>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b></p> <p>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b></p> | *Select all that apply |  |
| sc6_3_4_10 | <p>Estrus detection <b>Deteção do cio</b></p> <p>1 Adult household man <b>Homem adulto doméstico</b></p> <p>2 Adult household woman <b>Mulher adulto doméstico</b></p> <p>3 Boys <b>Rapazes</b></p> <p>4 Girls <b>Meninas</b></p> <p>5 Paid worker <b>trabalhador renumerado</b></p> <p>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b></p> <p>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b></p>                                                             | *Select all that apply |  |
| sc6_3_4_11 | <p>Cleaning of milking devices <b>Limpeza de dispositivos de ordenha</b></p> <p>1 Adult household man <b>Homem adulto doméstico</b></p> <p>2 Adult household woman <b>Mulher adulto doméstico</b></p> <p>3 Boys <b>Rapazes</b></p> <p>4 Girls <b>Meninas</b></p> <p>5 Paid worker <b>trabalhador renumerado</b></p> <p>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b></p> <p>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b></p>                              | *Select all that apply |  |

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| sc6_3_4_12 | Recordkeeping <b>Fazer os registros</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b>                                                 | *Select all that apply                                        |  |
| sc6_3_4_13 | Receive money from the milk cooperative <b>Receber dinheiro da cooperativa de leite</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b> | *Select all that apply                                        |  |
|            | Who makes the final decision on the following activities?<br><b>Quem toma a decisão final sobre as seguintes atividades</b>                                                                                                                                                                                                                                                                                                                                                     | *Read out all options <b>Leia todas as opções</b>             |  |
| sc6_5_1    | Allocation of milk sales revenues <b>Alocação de receita de vendas de leite</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b>                                                                                                                                                                              | *Select all that apply<br><b>Selecione tudo que se aplica</b> |  |

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|         | 6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                                                                                                                                                |                                                               |  |
| sc6_5_2 | Distribution of dairy activities (lawn mowing, Kraal cleaning, feeding of animals) <b>Distribuição de atividades leiteiras (corte do capim, limpeza do curral, alimentar os animais)</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b> | *Select all that apply<br><b>Selecione tudo que se aplica</b> |  |
| sc6_5_3 | Buying a Cow <b>Comprar uma vaca</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b>                                                                                                                                                     | *Select all that apply<br><b>Selecione tudo que se aplica</b> |  |
| sc6_5_4 | Purchases of products or equipment <b>Compras de produtos ou equipamentos</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b>                                                                                                                                                                                                                                                                                                                                                                                   | *Select all that apply<br><b>Selecione tudo que se aplica</b> |  |

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|         | 3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b>                                                                                                                                                                                                       |                                                               |  |
| sc6_5_5 | Distribution of household activities <b>Distribuição de atividades domésticas</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b> | *Select all that apply<br><b>Selecione tudo que se aplica</b> |  |
| sc6_5_6 | How to use crop revenues <b>Como usar as receitas das colheitas</b><br>1 Adult household man <b>Homem adulto doméstico</b><br>2 Adult household woman <b>Mulher adulto doméstico</b><br>3 Boys <b>Rapazes</b><br>4 Girls <b>Meninas</b><br>5 Paid worker <b>trabalhador renumerado</b><br>6 Nobody does/Activity not performed <b>Ninguém faz / atividade não executada</b><br>-99 Do not know/refuse to answer <b>-99 Não sabe / se recusa a responder</b>               | *Select all that apply<br><b>Selecione tudo que se aplica</b> |  |

## SECTION 7: PRODUCTION, DISPOSITION AND REVENUE

**[Transition]:** Enumerator: Now I have a few questions about the production of milk, and how you use it. It may be that it will be easier to answer these questions by referring to your book of records. Agora tenho poucas questões acerca da produção de leite e como você usa isso. Seria mais fácil responder a estas questões usando o seu livro de registros

| VARIABLES | PRODUCTION, DISPOSITION AND REVENUE                                                                                                                                                                       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                               | PMP INDICATOR  |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| sc7_04    | Do you keep a record of daily milk production? <b>Você faz registros da produção diária de leite?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                              | *Select only one option<br><b>Selecione apenas uma opção</b><br>*If they say yes, confirm from inspecting the record book<br><b>Se eles disserem sim, confirme ao inspecionar o livro de registro</b> | INDICATOR: #12 |
| sc7_05    | Do you keep a record of the allocation of milk produced to different sources? <b>Você faz registro da alocação de leite produzido para diferentes fontes?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>      | *Select only one option<br><b>Selecione apenas uma opção</b><br>*If they say yes, confirm from inspecting the record book<br><b>Se eles disserem sim, confirme ao inspecionar o livro de registro</b> | INDICATOR: #12 |
| sc7_06    | Do you keep a record of farm transactions (expenses and receipts)? <b>Você faz registros das transações (movimento financeiro) da farma (despesas e receitas)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b> | *Select only one option<br>**Select only one option<br><b>Selecione apenas uma opção</b><br>*If they say yes, confirm from inspecting the record book<br><b>Se eles disserem sim,</b>                 | INDICATOR: #12 |



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|                                                                                                                                                                                                                                                        |                                                                                                                                 | confirme ao inspecionar o livro de registro                                                                                                                                                                                  |                |
| sc7_07                                                                                                                                                                                                                                                 | Do you keep a record of farm visits? <b>Você mantém um registro das visitas a farma?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b> | **Select only one option<br><b>Selecione apenas uma opção</b><br>*If they say yes, confirm from inspecting the record book<br><b>Se eles disserem sim, confirme ao inspecionar o livro de registro</b>                       | INDICATOR: #12 |
| Sc7_08                                                                                                                                                                                                                                                 | Do you keep a record of dairy sales? <b>Você faz registros das vendas de leite?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>      | **Select only one option<br><b>Selecione apenas uma opção</b><br>*If they say yes, confirm from inspecting the record book<br><b>Se eles disserem sim, confirme ao inspecionar o livro de registro</b>                       | INDICATOR: #12 |
| <b>[Transition]</b> : Enumerator: Now think only about the production and sales of milk YESTERDAY. To the extent possible fill out sc7_3_1_1 - sc7_4_7_2 using the record book <i>Agora pense apenas acerca da produção e venda de leite de ONTEM.</i> |                                                                                                                                 |                                                                                                                                                                                                                              |                |
| sc7_2_1_1                                                                                                                                                                                                                                              | How many cows were producing yesterday?<br><b>Quantas vacas estavam produzindo ontem?</b>                                       | *Enter "0" if no cows were producing milk yesterday*<br><b>Digite "0" se nenhuma vaca estiver produzindo leite ontem</b><br>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b> | INDICATOR: #7  |

|           |                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                         |               |
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| Sc7_2_1_2 | Does the record book have information on the total volume of milk produced yesterday by all of your cows? <b>O livro de registro contém informações sobre o volume total de leite produzido ontem por todas as suas vacas?</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer <b>99 não sabe / se recusa a responder</b> | * Select only one option<br><b>Selecione apenas uma opção</b><br>*Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR<br>SC2_7_0_RECORD\$3 = 1 OR<br>SC2_7_0_RECORD\$4 = 1                                                                                                                                                                         |               |
| sc7_2_1_3 | How much total milk produced did your cows produce yesterday (both morning and evening milking)? Think about the total milk produced by all of your cows. Qual foi a quantidade total de leite produzido pelas suas vacas, ontem (tanto de manhã como a tarde)? <b>Pense no leite total produzido por todas as suas vacas.</b> | *Ask if sc7_3_1_1>0<br>*Enter in liters <b>Preencha em litros</b><br>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br>*If sc7_3_2_1_RECORD = 1, then fill from record book; else ask the respondents and fill out <b>depois preencha do livro de registro; pergunte aos entrevistados e preencha</b> | INDICATOR: #7 |
|           | How did you distribute the milk collected yesterday for different uses? <b>Como você distribuiu o leite coletado ontem para diferentes usos?</b>                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                         |               |
| sc7_2_1_4 | Consumption at home - yesterday (liters) <b>Consumo em casa- ontem (litros)</b>                                                                                                                                                                                                                                                | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                        |               |
| sc7_2_1_5 | Milk given to the offspring – yesterday (liters) <b>Leite dado aos vitelos ontem (litros)</b>                                                                                                                                                                                                                                  | *Enter -99 if Do not know/refuse to answer <b>Digite</b>                                                                                                                                                                                                                                                                                                |               |

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|            |                                                                                                                                                                                                                                           | -99 se não sabe / se recusa a responder                                                                                                                                                                                                          |                    |
| sc7_2_1_6  | Milk sold to milk collection center / cooperative - yesterday (liters) Leite vendido para centro de recolha de leite / cooperativa - ontem (litros)                                                                                       | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                                                        | INDICATORS: #1; #2 |
| sc7_2_1_7  | Milk sold to milk collection center/ cooperative - What was the price per liter of milk you received yesterday? Leite vendido para centro de recolha de leite / cooperativa - Qual foi o preço por litro de leite que você recebeu ontem? | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*Enter in Metical Insira em meticais                                                                                                                | INDICATORS: #1, #2 |
| sc7_2_1_8  | Which cooperative did you sell the milk produced yesterday? Please specify the name. A que cooperativa você vendeu o leite produzido ontem? Por favor, especifique o nome                                                                 | *Ask if sc7_3_3_1=3<br>*Enter -99 if do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*If sold to multiple cooperative, enter most important one Se for vendido para várias cooperativas, insira o mais importante |                    |
| sc7_2_1_9  | Milk sold to processors - yesterday (liters) Quantos litros de Leite vendeu ontem aos processadores (litros)                                                                                                                              | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                                                        | INDICATORS: #1; #2 |
| sc7_2_1_10 | Milk sold to processors - What price did you receive per liter of milk you sold yesterday? Leite vendido para processadores -                                                                                                             | *Enter -99 if Do not know/refuse to answer Digite                                                                                                                                                                                                | INDICATOR: #1      |

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|            | Qual o preço que você recebeu por litro de leite que você vendeu ontem?                                                                                                                                                                                                       | -99 se não sabe / se recusa a responder<br>*Enter in Metical <b>Insira em meticais</b>                                                                                                                                                  |                       |
| sc7_2_1_11 | Which processor did you sell the milk produced yesterday?<br>Please specify the name. <b>Qual processador você vendeu o leite produzido ontem? Por favor, especifique o nome.</b>                                                                                             | *Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br>*If sold to multiple cooperative, enter most important one <b>Se for vendido para várias cooperativas, insira o mais importante</b> |                       |
| sc7_2_1_12 | Milk sold locally (neighbors, occasional buyers, etc.) – yesterday - (liters) <b>Leite vendido localmente (vizinhos, compradores ocasionais, etc.) - ontem - (litros)</b>                                                                                                     | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                                                                                                                        | INDICATORS:<br>#1; #2 |
| sc7_2_1_13 | Milk sold locally (neighbors, occasional buyers, etc.) – What was the average price you received per liter of milk yesterday?<br><b>Leite vendido localmente (vizinhos, compradores ocasionais, etc.) - Qual foi o preço médio que você recebeu por litro de leite ontem?</b> | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br>*Enter in Metical <b>Insira em meticais</b>                                                                                         | INDICATOR: #1         |
| sc7_2_1_14 | Milk lost (waste, etc.) - yesterday (liters) <b>Leite perdido (desperdício, etc.) - ontem (litros)</b>                                                                                                                                                                        | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                                                                                                                        |                       |
| sc7_2_1_15 | Other (Specify) <b>Outro especifique</b>                                                                                                                                                                                                                                      | *Enter -99 if Do not know/refuse to answer <b>Digite</b>                                                                                                                                                                                | INDICATOR: #1         |

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|                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                        | -99 se não sabe / se recusa a responder                                                                                                         |                    |
| sc7_2_1_16                                                                                                                                                                                                                             | Other – yesterday (liters) <b>Outro - ontem (litros)</b>                                                                                                                                                                               | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                                | INDICATORS: #1; #2 |
| sc7_2_1_17                                                                                                                                                                                                                             | Other - What was the per liter value of milk you received yesterday? <b>Outros - Qual foi o valor por litro de leite que você recebeu ontem?</b>                                                                                       | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br>*Enter in Metical <b>Insira em meticais</b> | INDICATOR: #1      |
| sc7_2_1_18                                                                                                                                                                                                                             | Total - yesterday (liters) <b>Total - ontem (litros)</b>                                                                                                                                                                               | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                                | INDICATOR: #1      |
| <b>[Transition]:</b> Enumerator: Now think about ALL the milk produced and sold in the last dry season (May through October 2018) Agora pense acerca de todo o leite produzido e vendido na última época seca (Maio a Outubro de 2018) |                                                                                                                                                                                                                                        |                                                                                                                                                 |                    |
| Sc7_3_1_1                                                                                                                                                                                                                              | On average, how many cows were producing milk on a daily basis in the last dry season (May through October 2018)? <b>Em média, quantas vacas estavam produzindo leite diariamente na última estação seca (maio a outubro de 2018)?</b> | *Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                                |                    |
| Sc7_3_1_2                                                                                                                                                                                                                              | Does the record book have information on the total volume of milk produced on a daily basis in the last dry season (May through October 2018)? <b>O livro de registro contém</b>                                                       | *Select only one option<br>*Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR                                                            |                    |

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|           | <p>informações sobre o volume total de leite produzido diariamente na última estação seca (maio a outubro de 2018)?</p> <p>1 Yes Sim</p> <p>2 No não</p> <p>-99 Do not know/refuse to answer não sabe / se recusa a responder</p>                                                                                                                                                                                            | <p>SC2_7_0_RECORD\$3 = 1 OR</p> <p>SC2_7_0_RECORD\$4 = 1</p>                                                                              |               |
| sc7_3_1_3 | <p>Overage, how much total milk did your cows produce on a daily basis in the last dry season (May through October 2018). Think about the total milk produced by all cows on a daily basis in the last dry season. Em média, quanto leite total suas vacas produziram diariamente na última estação seca (maio a outubro de 2018). Pense no leite total produzido por todas as vacas diariamente na última estação seca.</p> | <p>*Enter in liters Insira em litros</p> <p>*Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder</p> | INDICATOR: #7 |
|           | <p>How did you distribute the milk collected at different times for different uses in the last dry season (May through October 2018)? Como você distribuiu o leite coletado em diferentes momentos para diferentes usos na última estação seca (maio a outubro de 2018)?</p>                                                                                                                                                 |                                                                                                                                           |               |
| sc7_3_1_4 | <p>Consumption at home - Dry season (May through October 2018) (liters) Consumo em casa - Estação seca (maio a outubro de 2018) (litros)</p>                                                                                                                                                                                                                                                                                 | <p>*Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder</p>                                          |               |
| sc7_3_1_5 | <p>Milk given to the offspring - Dry season (May through October 2018) (liters) Leite dado aos vitelos - Estação seca (maio a outubro de 2018) (litros)</p>                                                                                                                                                                                                                                                                  | <p>*Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder</p>                                          |               |

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| sc7_3_1_6  | Milk sold to milk collection center / cooperative - Dry season (May through October 2018) (liters) Leite vendido para centro de recolha de leite / cooperativa - Estação seca (maio a outubro de 2018) (litros)                                                                                                               | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                              | INDICATORS: #1; #2 |
| Sc7_3_1_7  | Milk sold to milk collection center/ cooperative - What was the average price per liter of milk you received in the dry season (May through October 2018)? Leite vendido para centro de recolha de leite / cooperativa - Qual foi o preço médio por litro de leite que você recebeu na estação seca (maio a outubro de 2018)? | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*Enter in Metical Insira em meticais                                                                                      | INDICATORS: #1, #2 |
| sc7_3_1_8  | Which cooperative did you sell the milk produced in the last dry season (May through October 2018)? Please specify the name. Qual cooperativa você vendeu o leite produzido na última estação seca (maio a outubro de 2018)? Por favor, especifique o nome.                                                                   | *Enter -99 if do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*If sold to multiple cooperatives, enter most important one Se vendido para várias cooperativas, insira o mais importante |                    |
| sc7_3_1_9  | Milk sold to processors - Dry season (May through October 2018) (liters) Leite vendido para processadores - Estação seca (maio a outubro de 2018) (litros)                                                                                                                                                                    | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                              | INDICATORS: #1; #2 |
| sc7_3_1_10 | Milk sold to processors - What price did you receive per liter of milk you sold in the dry season (May through October 2018)? Leite vendido a processadores – Qual e o valor que recebeu por litro de leite que vendeu na estação seca (maio a outubro de 2018)?                                                              | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*Enter in Metical Insira em meticais                                                                                      | INDICATOR: #1      |

|            |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                           |                    |
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| sc7_3_1_11 | Which processor did you sell the milk produced in the last dry season (May through October 2018)? Please specify the name.<br>Para que processador você vendeu o leite produzido na última estação seca (maio a outubro de 2018)?                                                                                                                      | *Enter -99 if do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*If sold to multiple processors, enter most important one Se for vendido para vários processadores, insira o mais importante |                    |
| sc7_3_1_12 | Milk sold locally (neighbors, occasional buyers, etc.) - Dry season (May through October 2018) (liters) Leite vendido localmente (vizinhos, compradores ocasionais, etc.) - Estação seca (maio a outubro de 2018) (litros)                                                                                                                             | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                                 | INDICATORS: #1; #2 |
| sc7_3_1_13 | Milk sold locally (neighbors, occasional buyers, etc.) – What was the average price you received per liter of milk in the last dry season (May through October 2018) ? Leite vendido localmente (vizinhos, compradores ocasionais, etc.) - Qual foi o preço médio que você recebeu por litro de leite na última estação seca (maio a outubro de 2018)? | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*Enter in Metical Insira em meticais                                                                                         | INDICATOR: #1      |
| sc7_3_1_14 | Milk lost (waste, etc.) - Dry season (May through October 2018) (liters) Leite perdido ( perdas, etc.) - Estação seca (maio a outubro de 2018) (litros)                                                                                                                                                                                                | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                                 |                    |
| sc7_3_1_15 | Other (Specify) Outro especifique)                                                                                                                                                                                                                                                                                                                     | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                                 | INDICATOR: #1      |



|                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                     |                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| sc7_3_1_16                                                                                                                                                                                                                                                         | Other - Dry season (May through October 2018) (liters) <b>Outros</b><br>- <b>Estação seca (maio a outubro de 2018) (litros)</b>                                                                                                                                                                                                                                | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                    | INDICATORS:<br>#1; #2 |
| sc7_3_1_17                                                                                                                                                                                                                                                         | Other - What was the per liter value of milk in the last dry season (May through October 2018)? <b>Outros - Qual foi o valor por litro de leite na última estação seca (maio a outubro de 2018)?</b>                                                                                                                                                           | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br>*Enter in Metical               | INDICATOR: #1         |
| sc7_3_1_18                                                                                                                                                                                                                                                         | Total - Dry season in the last 12 months (May through October 2018) (liters) <b>Total - Estação seca nos últimos 12 meses (maio a outubro de 2018) (litros)</b>                                                                                                                                                                                                | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                    | INDICATOR: #1         |
| <b>[Transition]:</b> Enumerator: Now think about ALL the milk produced and sold in the last rainy season (November 2018 through April 2019)<br><b>Agora pense em TODO o leite produzido e vendido na última estação chuvosa (novembro de 2018 a abril de 2019)</b> |                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                     |                       |
| Sc7_4_1_1                                                                                                                                                                                                                                                          | On average, how many cows were producing milk on a daily basis in the last rainy season (November 2018 through April 2019)? <b>Em média, quantas vacas estavam a produzir leite diariamente na última estação chuvosa (novembro de 2018 a abril de 2019)?</b>                                                                                                  | *Enter -99 if do not <b>Insira em litros</b><br>know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>         |                       |
| Sc7_4_1_2                                                                                                                                                                                                                                                          | Does the record book have information on the total volume of milk produced on a daily basis in the last rainy season (November 2018 through April 2019)? <b>O livro de registro contém informações sobre o volume total de leite produzidos diariamente na última estação chuvosa (Novembro, 2018 a abril de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No <b>não</b> | *Select only one option<br>*Ask if SC2_7_0_RECORD\$1 = 1 OR SC2_7_0_RECORD\$2 = 1 OR SC2_7_0_RECORD\$3 = 1 OR SC2_7_0_RECORD\$4 = 1 |                       |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                              |                       |
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|           | -99 Do not know/refuse to answer <b>não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                              |                       |
| sc7_4_1_3 | On average, how much milk did your cows produce on a daily basis in the last rainy season (November 2018 to April 2019) (liters). Think about the total milk produced by all cows on a daily basis in the last rainy season. <b>Em média, quanto leite suas vacas produziram diariamente na última estação chuvosa (novembro de 2018 a abril de 2019) (litros). Pense no leite total produzido por todas as vacas diariamente na última estação chuvosa.</b> | *Enter in liters <b>Insire em litros</b><br>*Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b> | INDICATOR:<br>#7      |
|           | How did you distribute the milk collected at different times for different uses in the last rainy season (November 2018 through April 2019)? <b>Como você distribuiu o leite coletado em diferentes momentos para diferentes usos na última estação chuvosa (novembro de 2018 a abril de 2019)?</b>                                                                                                                                                          |                                                                                                                                              |                       |
| sc7_4_1_4 | Consumption at home - Rainy season (November 2018 through April 2019) (liters) <b>Consumo em casa - estação chuvosa (novembro de 2018 a abril de 2019) (litros)</b>                                                                                                                                                                                                                                                                                          | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                             |                       |
| sc7_4_1_5 | Milk given to the offspring - Rainy season (november to april) (liters) <b>Leite dado aos vitelos - Estação chuvosa (novembro a abril) (litros)</b>                                                                                                                                                                                                                                                                                                          | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                             |                       |
| sc7_4_1_6 | Milk sold to milk collection center/ cooperative - Rainy season (November 2018 through April 2019) (liters) <b>Leite vendido para centro de recolha de leite / cooperativa - Estação chuvosa (novembro de 2018 a abril de 2019) (litros)</b>                                                                                                                                                                                                                 | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                             | INDICATORS:<br>#1; #2 |

|            |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                       |                       |
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| sc7_4_1_7  | Milk sold to milk collection center/ cooperative - What was the average price per liter of milk you received in the rainy season (November 2018 through April 2019)? Leite vendido para centro de recolha de leite / cooperativa - Qual foi o preço médio por litro de leite que você recebeu na estação chuvosa (novembro de 2018 a abril de 2019)? | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*Enter in Metical Insira em litros                                                                                       | INDICATORS:<br>#1, #2 |
| sc7_4_1_8  | Which cooperative did you sell the milk produced in the last rainy season (November 2018 through April 2019)? Please specify the name.<br>Para qual cooperativa você vendeu o leite produzido na última estação chuvosa (novembro de 2018 a abril de 2019)? Por favor, especifique o nome.                                                           | *Enter -99 if do not know/refuse to answer Digite -99 se não sabe / se recusa a responder<br>*If sold to multiple cooperatives, enter most important one Se vendeu para várias cooperativas, insira o mais importante |                       |
| sc7_4_1_9  | Milk sold to processors - Rainy season (November to April) (liters) Leite vendido para processadores - Estação chuvosa (novembro a abril) (litros)                                                                                                                                                                                                   | *Enter -99 if Do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                             | INDICATORS:<br>#1; #2 |
| sc7_4_1_10 | Milk sold to processors - What price did you receive per liter of milk you sold in the rainy season (November 2018 through April 2019)? Leite vendido para processadores - Que preço você recebeu por litro de leite que vendeu na estação chuvosa (novembro de 2018 a abril de 2019)?                                                               | *Enter -99 if Do not know/refuse to answer *Enter in Metical Digite -99 se não sabe / se recusa a responder                                                                                                           | INDICATOR:<br>#1      |
| sc7_4_1_11 | Which processor did you sell the milk produced in the last rainy season (November 2018 through April 2019)? Please specify the name. Para qual processador você vendeu o leite produzido na última estação chuvosa (novembro de 2018 a abril de 2019)? Por favor, especifique o nome.                                                                | *Enter -99 if do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                                                                                             |                       |

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|            |                                                                                                                                                                                                                                                                                                                                                                                     | *If sold to multiple processors, enter most important one <b>Se for vendido para vários processadores, insira o mais importante</b>           |                    |
| sc7_4_1_12 | Milk sold locally (neighbors, occasional buyers, etc.) - Rainy season (November 2018 through April 2019) (liters) <b>Leite vendido localmente (vizinhos, compradores ocasionais, etc.) - Estação chuvosa (novembro de 2018 a abril de 2019) (litros)</b>                                                                                                                            | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                              | INDICATORS: #1; #2 |
| sc7_4_1_13 | Milk sold locally (neighbors, occasional buyers, etc.) – What was the average price you received per liter of milk in the last rainy season (November 2018 through April 2019)? <b>Leite vendido localmente (vizinhos, compradores ocasionais, etc.) - Qual foi o preço médio que você recebeu por litro de leite na última estação chuvosa (novembro de 2018 a abril de 2019)?</b> | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br>*Enter in Metical <b>Insira em litros</b> | INDICATOR: #1      |
| sc7_4_1_14 | Milk lost (waste, etc.) - Rainy season (November 2018 through April 2019) (liters) <b>Leite perdido (perdas , etc.) - Estação chuvosa (novembro de 2018 a abril de 2019) (litros)</b>                                                                                                                                                                                               | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                              |                    |
| sc7_4_1_15 | Other (Specify) <b>Outro especifique)</b>                                                                                                                                                                                                                                                                                                                                           | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                              | INDICATOR: #1      |
| sc7_4_1_16 | Other - Rainy season (November 2018 through April 2019) (liters) <b>Outros - estação chuvosa (novembro de 2018 a abril de 2019) (litros)</b>                                                                                                                                                                                                                                        | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                              | INDICATORS: #1; #2 |

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| sc7_4_1_17                                                                                                                                                                  | Other - What was the per liter value of milk in the rainy season (November 2018 through April 2019)? <b>Outros - Qual foi o valor por litro de leite na estação chuvosa (novembro de 2018 a abril de 2019)?</b>                                                                   | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br>*Enter in Metical <b>Insira em litros</b> | INDICATOR:<br>#1 |
| sc7_4_1_18                                                                                                                                                                  | Total - Rainy season in the last 12 months (November 2018 through April 2019) (liters) <b>Total - estação chuvosa nos últimos 12 meses (novembro de 2018 a abril de 2019) (litros)</b>                                                                                            | *Enter -99 if Do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b>                                              | INDICATOR:<br>#1 |
| <b>[Transition]: Enumerator: Now I would like to ask about the quality of milk you sell <i>Agora eu gostaria de perguntar sobre a qualidade do leite que você vende</i></b> |                                                                                                                                                                                                                                                                                   |                                                                                                                                               |                  |
| sc7_11                                                                                                                                                                      | Have you ever had milk refused by a buyer in the past twelve months (July 1, 2018 – June 30, 2019)? <b>Você já teve leite rejeitado por um comprador nos últimos doze meses (1º de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option                                                                                                                       |                  |
| sc7_12                                                                                                                                                                      | How many times has the milk been refused in the past 12 months between July 1, 2018 – June 30, 2019? <b>Quantas vezes o leite foi rejeitado nos últimos 12 meses entre 1 de julho de 2018 e 30 de junho de 2019?</b>                                                              | *Ask if sc7_11 = 1<br>*Enter -99 if Do not know/refuse to answer                                                                              |                  |
|                                                                                                                                                                             | What were the reasons for milk rejection? <b>Quais foram as razões para a rejeição do leite?</b>                                                                                                                                                                                  | *Ask if sc7_11 = 1                                                                                                                            |                  |
| sc7_13_1                                                                                                                                                                    | Mastitis <b>Mastite</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b>                                                                                                                                                                                                                    | *Ask if sc7_11 = 1<br>*Select only one option                                                                                                 |                  |

|                |                                                                                                                                                  |                                               |  |
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|                | -99 Do not know/refuse to answer 99 Não sabe / recusa responder                                                                                  |                                               |  |
| sc7_13_2       | Milk had been boiled Leite foi fervido<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer 99 Não sabe / recusa responder               | *Ask if sc7_11 = 1<br>*Select only one option |  |
| sc7_13_3       | Water was added to milk Água foi adicionada ao leite<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer 99 Não sabe / recusa responder | *Ask if sc7_11 = 1<br>*Select only one option |  |
| sc7_13_4       | Other Outros<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer 99 Não sabe / recusa responder                                         | *Ask if sc7_11 = 1<br>*Select only one option |  |
| sc7_13_3_OTHER | Other, please specify Outro (por favor, especifique                                                                                              | *Ask if sc7_13_3 = 1                          |  |

## SECTION 8: FINANCE AND INVESTMENTS

**[Transition]:** Enumerator: Now we would like to ask about your finance and investments. *Agora gostaríamos de perguntar sobre seus financiamentos e investimentos.*

| VARIABLES | FINANCE AND INVESTMENTS                                                                                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS | PMP INDICATOR  |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------|
| sc8_1     | Has your household made any investment in the milk business in the last 12 months (July 1, 2018 – June 30, 2019)? Sua família (casa) fez algum investimento no setor de leite nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?<br>1 Yes Sim | *Select only one option | INDICATOR: #24 |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                      |               |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------|
|         | 2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>99 Não sabe / recusa responder</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                      |               |
| sc8_1_1 | What investments did you make? <b>Quais investimentos você fez?</b><br>1 Build/maintain infrastructure for cattle <b>Construir / manter infraestrutura para gado</b><br>2 Purchase/maintain new equipment or machinery <b>Compra / manutenção de novos equipamentos ou máquinas</b><br>3 Purchase cattle <b>Compra de gado</b><br>4 Purchase different livestock (other than cattle) <b>Compra de animais diferentes (exceto bovinos)</b><br>5 Purchase feed/veterinary care or other such inputs <b>Compra de ração / cuidados veterinários ou outros insumos</b><br>6 Paying off other debts <b>Pagando outras dívidas</b><br>7 Other, specify <b>Outro (por favor, especifique)</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa responder</b> | *Ask if sc8_1 = 1<br>*Select all that apply                                          |               |
| sc8_1_2 | How much money did you invest in this(these)?<br><b>Quanto dinheiro você investiu nisso?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | *Enter -99 if Do not know/refuse to answer<br>*Ask if sc8_1 = 1<br>*Enter in Metical | INDICATOR: #1 |
| sc8_1_3 | What was the source of funding? <b>Qual foi a fonte do financiamento?</b><br>1 Self / auto financing <b>auto financiamento</b><br>2 Informal family, neighbors, friends <b>informal, Família vizinhos, amigos</b><br>3 Formal loan (bank) <b>Empréstimo formal (banco)</b><br>4 MERCADO Grant/Award <b>Bolsa / Prêmio MERCADO</b><br>5 VSLA <b>VSLA</b><br>6 Other Grant / Award <b>Outra bolsa/premio</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa responder</b>                                                                                                                                                                                                                                                                             | *Select all that apply<br>*Ask if sc8_1 = 1                                          |               |

## SECTION 9: EFFECTS OF CYCLONE IDAI

**[Transition]:** Enumerator: Thank you for your responses thus far. Now, we would like to learn about the effects on your dairy farm production due to Cyclone Idai. We will ask about how it has influenced your cattle, dairy production, and sales. **Obrigado por suas respostas até agora. Agora, gostaríamos de conhecer os efeitos na produção de sua farma leiteira devido ao ciclone Idai. Perguntaremos como isso influenciou seu gado, a produção de leite e as vendas.**

| VARIABLES                                                | EFFECTS OF CYCLONE IDAI                                                                                                                                                                                                                                                                                                                    | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                         | PMP INDICATOR |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| sc9_1                                                    | Did you lose any dairy cattle due to Cyclone Idai? <b>Você perdeu algum gado leiteiro devido ao Ciclone Idai?</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer <b>99 Não sabe / recusa responder</b>                                                                                                                               | *Select only one option <b>Selecione apenas uma opção</b>                                                                                                                                                       |               |
| sc9_2\$1<br>sc9_2\$2<br>sc9_2\$3<br>sc9_2\$4<br>sc9_2\$5 | How many dairy cattle did you lose due to Cyclone Idai? <b>Quanto gado leiteiro você perdeu devido ao ciclone Idai?</b><br>Bulls _____ <b>Touros</b> _____<br>Cows _____ <b>Vacas</b> _____<br>Heifers _____ <b>Novilhas</b> _____<br>Female calves _____ <b>Vitelas (femeas)</b> _____<br>Male calves _____ <b>Vitelos (machos)</b> _____ | *Ask if sc9_1 = 1<br>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br><br>*Enter 0 if cattle type not lost <b>Digite 0 se o tipo de gado não for perdido</b> |               |
| sc9_3                                                    | Did any of your dairy cattle succumb to disease after Cylone Idai? <b>Algum do seu gado leiteiro sucumbiu à doença depois do Cylone Idai?</b><br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer <b>99 Não sabe / recusa se a responder</b>                                                                                              | *Select only one option <b>Selecione apenas uma opção</b>                                                                                                                                                       |               |



|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                             |  |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| sc9_3_1\$1<br>sc9_3_1\$2<br>sc9_3_1\$3<br>sc9_3_1\$4<br>sc9_3_1\$5 | How many dairy cattle were affected by disease due to Cyclone Idai? <b>Quantos bovinos leiteiros foram afetados pela doença devido ao Ciclone Idai?</b><br>Bulls _____ <b>Touros</b> _____<br>Cows _____ <b>Vacas</b> _____<br>Heifers _____ <b>Novilhas</b> _____<br>Female calves _____ <b>Vitelas (fêmeas)</b> _____<br>Male calves _____ <b>Vitelos (machos)</b> _____                                                                                               | *Ask if sc9_3 = 1<br>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe / se recusa a responder</b><br><br>*Enter 0 if cattle type not affected by disease<br><b>Digite 0 se o tipo de gado não é afetado pela doença</b> |  |
| sc9_3_2                                                            | Which diseases have your dairy cattle been affected by due to Cyclone Idai? <b>Quais doenças afetaram seu gado leiteiro devido ao ciclone Idai?</b><br>1 Foot and mouth disease <b>Febre aftosa</b><br>2 Mastitis <b>Mastite</b><br>3 Lumpy skin disease <b>dermatite nodular</b><br>4 Other, specify <b>Outros , especifique</b><br>-99 Do not know/refuse to answer <b>99 Não sabe / recusa se a responder</b>                                                         | *Select all that apply <b>Selecione tudo que se aplica</b><br>*Ask if sc9_3 = 1                                                                                                                                                             |  |
| sc9_4                                                              | How did your cow's milk production per day change as a result of Cyclone Idai, if at all? <b>Como variou a produção de leite de sua vaca por dia, como resultado do ciclone Idai?</b><br>1 Production per day decreased <b>produção por dia diminuiu</b><br>2 Production per day remained same/no effect<br><b>Produção por dia permaneceu igual / sem efeito</b><br>3 Production per day increased <b>Produção por dia aumentou</b><br>-99 Do not know/refuse to answer | *Select only one option <b>Selecione apenas uma opção</b>                                                                                                                                                                                   |  |
| sc9_4_1                                                            | By how many liters did the milk production change per day, per cow, on average?                                                                                                                                                                                                                                                                                                                                                                                          | *Ask if sc9_4 = 1 or sc9_4 = 3                                                                                                                                                                                                              |  |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                            |  |
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|         | _____ Por quantos litros a produção de leite mudou por dia, por vaca, em média?                                                                                                                                                                                                                                                                                                                                                                                                                                                                | *Enter -99 if do not know/refuse to answer Digite -99 se não sabe / se recusa a responder                                                  |  |
| sc9_5   | <p>Were any of the following items of your dairy business impacted by Cyclone Idai? <i>Algum dos seguintes itens do seu negócio de leite foram afectados pelo ciclone Idai?</i></p> <ol style="list-style-type: none"> <li>1 Dairy infrastructure <i>Infraestrutura leiteira</i></li> <li>2 Feed supplies <i>suprimentos de alimentação</i></li> <li>3 Other, specify <i>Outros , especifique</i></li> <li>-99 Do not know/refuse to answer <i>99 Não sabe / recusa se responder</i></li> </ol>                                                | <p>*Select all that apply <i>Selecione tudo que se aplica</i></p> <p>*Read list for respondent <i>Leia a lista para o entrevistado</i></p> |  |
| sc9_5_1 | <p>What dairy infrastructure was impacted by Cyclone Idai? <i>Qual infraestrutura leiteira sofreu o impacto do ciclone Idai?</i></p> <ol style="list-style-type: none"> <li>1 Housing for dairy cattle <i>Habitação para gado leiteiro</i></li> <li>2 Water sources for dairy cattle <i>Fontes de água para gado leiteiro</i></li> <li>3 Milking equipment <i>equipamento de ordenha</i></li> <li>4 Other, specify <i>Outros , especifique</i></li> <li>-99 Do not know/refuse to answer <i>99 Não sabe / recusa se a responder</i></li> </ol> | <p>*Select all that apply <i>Selecione tudo que se aplica</i></p> <p>*Ask if sc9_5 = 1</p>                                                 |  |
| sc9_6   | <p>How has your access to dairy inputs changed as a result of Cyclone Idai, if at all? <i>Como alterou o seu acesso aos insumos para a produção de leite como resultado do Cyclone Idai?</i></p> <ol style="list-style-type: none"> <li>1 More difficult to access inputs <i>Mais difícil obter insumos</i></li> <li>2 Same/no effect <i>Mesmo / nenhum efeito</i></li> <li>3 Easier to access inputs <i>Mais fácil acessar insumos</i></li> </ol>                                                                                             | *Select only one option <i>Selecione apenas uma opção</i>                                                                                  |  |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                              |  |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--|
|         | -99 Do not know/refuse to answer 99 Não sabe /<br>recusa responder                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                              |  |
| sc9_7   | How has your ability to sell your milk changed as a result of Cyclone Idai, if at all? Como a sua capacidade de vender seu leite mudou como resultado do Cyclone Idai?<br>1 More difficult to sell Mais difícil de vender<br>2 Same/No effect Mesmo / Nenhum efeito<br>3 Easier to sell Mais fácil de vender                                                                                                                    | *Select only one option Selecione apenas uma opção                                                                                           |  |
| sc9_8   | How has the average price of milk obtained from selling milk changed as a result of Cyclone Idai, if at all? Como o preço médio do leite obtido da venda de leite mudou como resultado do ciclone Idai?<br>1 Average sale price is lower Preço médio de venda é menor<br>2 Average sale price is same/No effect O preço médio de venda é o mesmo / nenhum efeito<br>3 Average sale price is higher Preço médio de venda é maior | *Select only one option Selecione apenas uma opção                                                                                           |  |
| sc9_8_1 | By how much did the average price change per liter of milk, on average? Por quanto o preço médio se alterou por litro de leite, em média?<br>_____                                                                                                                                                                                                                                                                              | *Ask if sc9_8=1 OR sc9_8=3<br>*Enter in Metical<br>*Enter -99 if do not know/refuse to answer Digite -99 se não sabe / se recusa a responder |  |
| sc9_9   | How has Cyclone Idai influenced your household's ability to have access to or availability of adequate food, if at all? Como o Cyclone Idai influenciou a capacidade de sua família de ter acesso ou disponibilidade de comida adequada, se é que o fez?<br>1 Lowered access to or availability of food Acesso reduzido ou disponibilidade reduzida de alimentos                                                                | *Select only one option Selecione apenas uma opção                                                                                           |  |

|  |                                                                                                                                                                                                                                                                                                                 |  |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  | <p>2 No effect on access to or availability of food <b>Nenhum efeito no acesso ou disponibilidade de alimentos</b></p> <p>3 Increased access to or availability of food <b>Maior acesso ou disponibilidade de alimentos</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa se a responder</b></p> |  |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

## SECTION 10: EXPERIENCE WITH MERCADO

**[Transition]:** Enumerator: Thank you! I want to ask you about how you think your dairying has changed based on your environment in the MERCADO project. *Obrigado! Eu quero perguntar a você como acha que seu negócio do leite mudou com base no seu ambiente no projeto MERCADO.*

| VARIABLES | EFFECTS OF CYCLONE IDAI                                                                                                                                                                                                                                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                                                                                                                                             | PMP INDICATOR |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Sc10_3_1  | Based on your experience with MERCADO, how has your milk production per cow changed, if at all? <i>Com base em sua experiência com a MERCADO, como sua produção de leite por vaca mudou?</i><br>1 Increased <i> aumentou</i><br>2 Stayed the same <i> permaneceu o mesmo</i><br>3 Decreased <i> diminuiu</i><br>-99 Do not know/refuse to answer <i> Não sabe / recusa se a responder</i>                    | *Ask if sc10_1 = 1<br>*Select only one option <i> Selecione apenas uma opção</i>                                                                                                    |               |
| Sc10_3_2  | Based on your experience with MERCADO, how has your total income from dairy production changed, if at all? <i>Com base na sua experiência com a MERCADO, como sua renda total da produção de leite mudou?</i><br>1 Increased <i> aumentou</i><br>2 Stayed the same <i> permaneceu o mesmo</i><br>3 Decreased <i> diminuiu</i><br>4 -99 Do not know/refuse to answer <i> Não sabe / recusa se a responder</i> | *Select only one option <i> Selecione apenas uma opção</i>                                                                                                                          |               |
| Sc10_3_3  | Based on your experience with MERCADO, how has your access to information changed, if at all? <i>Com base na sua experiência com a MERCADO, como o seu acesso à informação mudou, se é que mudou?</i><br>1 Increased <i> aumentou</i><br>2 Stayed the same <i> permaneceu o mesmo</i>                                                                                                                        | *Explain – information could mean information about market prices, information about diseases, inputs etc. Explique - <i> informações podem significar informações sobre preços</i> |               |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                               |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|          | <p>3 Decreased <b>diminuiu</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa se a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                   | <p>de mercado, informações sobre doenças, insumos etc.</p> <p>*Select only one option</p>                                                                                                                                                                                                                     |  |
| Sc10_3_4 | <p>Based on your experience with MERCADO, how has your access to buyers changed, if at all? <b>Com base na sua experiência com a MERCADO, como o seu acesso aos compradores mudou, se é que mudou?</b></p> <p>1 Increased <b>aumentou</b></p> <p>2 Stayed the same <b>permaneceu o mesmo</b></p> <p>3 Decreased <b>diminuiu</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa se a responder</b></p>                                                                                  | <p>*Select only one option <b>Selecione apenas uma opção</b></p>                                                                                                                                                                                                                                              |  |
| Sc10_3_5 | <p>Based on your experience with MERCADO, how has your access to dairy inputs changed, if at all? <b>Com base na sua experiência com a MERCADO, como o seu acesso aos insumos para a produção de leite mudou?</b></p> <p>1 Increased <b>aumentou</b></p> <p>2 Stayed the same <b>permaneceu o mesmo</b></p> <p>3 Decreased <b>diminuiu</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa se a responder</b></p>                                                                       | <p>*Select only one option <b>Selecione apenas uma opção</b></p> <p>*Explain: dairy inputs can include food and feed supplements, medicines, veterinary care etc.</p> <p><b>Explique: os insumos lácteos podem incluir alimentos e suplementos alimentares, medicamentos, cuidados veterinários, etc.</b></p> |  |
| sc10_4_1 | <p>Based on your experience with MERCADO, how has the way you house your cows changed, if at all? <b>Com base na sua experiência com a MERCADO, como mudou a maneira como você abriga suas vacas?</b></p> <p>1 Feeder/food receptacle in the kraal <b>Alimentador / comedouro no kraal</b></p> <p>2 Water cooler/water receptacle in the kraal <b>2 refrigerador de água / bebedouro no kraal</b></p> <p>3 Sheet cover to give shade in the kraal <b>chapa de zinco para dar sombra no kraal</b></p> | <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> <p>*If “6” or “-99” is selected make sure no other option is selected</p> <p><b>Se “6” ou “-99” estiver selecionado, certifique-se de que nenhuma outra opção esteja selecionada</b></p>                                                    |  |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|          | <p>4 Cement in the milking area in the kraal <b>Cimento na área de ordenha no kraal</b></p> <p>5 A dry ground in the kraal <b>Um terreno seco no curral</b></p> <p>6 Other, please specify <b>Outro, por favor especifique</b></p> <p>7 No change/stayed the same <b>Nenhuma mudança / permaneceu o mesmo</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa se a responder</b></p>                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| sc10_4_2 | <p>Based on your experience with MERCADO, how has the way you breed your dairy cows changed? <b>Com base na sua experiência com a MERCADO, como foi que o método de reprodução das suas vacas leiteiras mudou?</b></p> <p>1 Use artificial insemination more <b>Usar mais de inseminação artificial</b></p> <p>2 Use natural breeding more <b>Usar mais a criação natural</b></p> <p>3 Other, please specify <b>Outro, por favor especifique</b></p> <p>4 No change/stayed the same <b>Nenhuma mudança / permaneceu o mesmo</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / recusa se a responder</b></p> | *Select only one option <b>Selecione apenas uma opção</b>                                                                                                                                                                                                                                                                                                                                                   |  |
| sc10_4_3 | <p>Based on your experience with MERCADO, how has the way your feed your cows changed? <b>Com base na sua experiência com a MERCADO, como mudou o modo de alimentar suas vacas?</b></p> <p>1 Use zero grazing land more <b>Usa mais terra para o zero-grazing</b></p> <p>2 Use supplements more <b>Use mais suplementos</b></p> <p>3 Use fodder/forage more <b>Use mais forragem</b></p> <p>4 Other, please specify <b>Outro, por favor especifique</b></p> <p>5 No change/stayed the same <b>Nenhuma mudança / permaneceu o mesmo</b></p>                                                                          | <p>*Select all that apply</p> <p>*If "4" or "-99" is selected make sure no other option is selected <b>Se "4" ou "-99" estiver selecionado, certifique-se de que nenhuma outra opção esteja selecionada.</b></p> <p>*Explain: Improved feeding means use of zero grazing and use of supplements &amp; fodder/forage</p> <p>Explique: <b>Alimentação melhorada significa uso de pastoreio zero e uso</b></p> |  |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                          |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|          | -99 Do not know/refuse to answer Não sabe / recusa se a responder                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | de suplementos e forragem / forragem                                                                                                                                                                     |  |
| sc10_4_4 | <p>Based on your experience with MERCADO, how has your use of water changed? Com base na sua experiência com a MERCADO, como o seu uso de água mudou?</p> <ol style="list-style-type: none"> <li>1 Started providing cattle continuous access to water 1 Começou a fornecer ao gado acesso contínuo à água</li> <li>2 Started bringing more water to cattle Começou a trazer mais água para o gado</li> <li>3 Other, please specify Outro, por favor especifique</li> <li>4 No change/stayed the same Nenhuma mudança / permaneceu o mesmo</li> </ol> <p>-99 Do not know/refuse to answer Não sabe / recusa se a responder</p> | <p>*Select all that apply</p> <p>*If “3” or “-99” is selected make sure no other option is selected Se “3” ou “-99” estiver selecionado, certifique-se de que nenhuma outra opção esteja selecionada</p> |  |
| sc10_4_5 | <p>Based on your experience with MERCADO, how has your use of animal health services changed? Com base na sua experiência com a MERCADO, como seu uso dos serviços de saúde animal mudou?</p> <ol style="list-style-type: none"> <li>1 Started weekly tick treatments 1 Começou tratamentos semanais de carraças</li> <li>2 Started vaccinating cattle 1 começou a vacinar o gado</li> <li>3 Nenhuma mudança / permaneceu o mesmo</li> </ol> <p>-99 Do not know/refuse to answer Não sabe / recusa se responder</p>                                                                                                            | <p>*Select only one option Selecione apenas uma opção</p>                                                                                                                                                |  |



## SECTION 11: CONCLUSION

**[Transition]:** Enumerator: Thank you for your responses up to now. We have a few remaining questions. *Obrigado por suas respostas até agora. Temos algumas perguntas restantes*

| VARIABLES                                                                                    | CONCLUSION                                                                                                                                                              | ENUMERATOR INSTRUCTIONS                                                                    | PMP INDICATOR |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------|
| Sc11_1                                                                                       | Can we visit the Kraal? <i>Podemos visitar o curral?</i><br>1 Yes <i>Sim</i><br>2 No <i>Não</i>                                                                         | *Select only one option<br><i>Selecione apenas uma opção</i><br>*If sc11_1=2, go to sc11_3 |               |
| <b>[Enumerator Instruction]:</b> Ask sc11_2_1 to sc11_2_7 if sc11_1 = 1, else skip to sc11_3 |                                                                                                                                                                         |                                                                                            |               |
| Sc11_2_1                                                                                     | Accumulation of manure <i>Acumulação de estrume</i><br>1 Yes <i>Sim</i><br>2 No <i>Não</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa se a responder</i>  | *Select only one option<br><i>Selecione apenas uma opção</i>                               |               |
| Sc11_2_2                                                                                     | Existence of coverage <i>Existência de cobertura</i><br>1 Yes <i>Sim</i><br>2 No <i>Não</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa se a responder</i> | *Select only one option<br><i>Selecione apenas uma opção</i>                               |               |
| Sc11_2_3                                                                                     | Ventilation <i>Ventilação</i><br>1 Yes <i>Sim</i><br>2 No <i>Não</i><br>-99 Do not know/refuse to answer <i>Não sabe / recusa se a responder</i>                        | *Select only one option<br><i>Selecione apenas uma opção</i>                               |               |
| Sc11_2_4                                                                                     | Cement area in milking area <i>Área de cimento na área de ordenha</i><br>1 Yes <i>Sim</i><br>2 No <i>Não</i>                                                            | *Select only one option<br><i>Selecione apenas uma opção</i>                               |               |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                              |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--|
|          | -99 Do not know/refuse to answer <b>Não sabe / recusa se a responder</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                              |  |
| Sc11_2_5 | Clean zone and freshwater ad libidum <b>Zona limpa e água ad libidum</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / recusa se a responder</b>                                                                                                                                                                                                                                                                                                                       | *Select only one option<br><b>Selecione apenas uma opção</b> |  |
| Sc11_2_6 | Existence of receptors for fodder <b>Existência de comedouros para forragem</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>99 Não sabe / recusa responder</b>                                                                                                                                                                                                                                                                                                                  | *Select only one option<br><b>Selecione apenas uma opção</b> |  |
| Sc11_2_7 | Dry floor <b>Chão seco</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>99 Não sabe / recusa responder</b>                                                                                                                                                                                                                                                                                                                                                                       | *Select only one option<br><b>Selecione apenas uma opção</b> |  |
| Sc11_3   | It may be that in the coming days, you will receive a call to check out some of the answers you gave. This is part of our survey quality survey process. Are you willing to receive a short call for this purpose? <b>Pode ser que nos próximos dias, você receba uma ligação para verificar algumas das respostas que deu. Isso faz parte do nosso processo de pesquisa de qualidade de pesquisa. Você está disposto a receber uma chamada curta para esse propósito?</b><br>1 Yes <b>sim</b><br>2 No <b>Nao</b> | *Select only one option<br><b>Selecione apenas uma opção</b> |  |

**[Transition]: Enumerator: Thank you! Obrigado**

## MERCADO MIDTERM SEMI-STRUCTURED INTERVIEW PROTOCOLS

### 1. Aggregation & Value Addition Facilities (Cooperatives) Semi-Structured Survey

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|
| Interviewer name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |    |
| Interview date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |    |
| Interview time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |    |
| Cooperative/<br>Aggregation Name<br>name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |    |
| Respondent name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |    |
| Respondent<br>position/title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |    |
| Respondent gender                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1 Male 2 Female   |    |
| Contact information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |    |
| GPS coordinates:<br>latitude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |    |
| GPS coordinates:<br>longitude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |    |
| Province:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1 Manica 2 Sofala |    |
| District:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |    |
| Community:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |    |
| <b>INTRODUCTION:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |    |
| <p>Thank you for taking the time today to meet with me/us. I work for IMPAQ International, a US-based research company. Joining me is _____, who works for _____. Land O'Lakes International Development has contracted IMPAQ International to collect data for an evaluation of the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project.</p> <p><b>Present letter of introduction.</b></p> <p>Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique. Your answers will be kept confidential and will not be used for any purpose other in a report that will help inform the dairy project being implemented by Land O' Lakes.</p> <p>The interview should last about an hour. Participation is voluntary and you can choose not to take part. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer. Land O'Lakes would like you to feel free to be open and honest in your responses. Knowing the true situation in your dairy aggregation activities will help them provide better support to you in the future. There are no penalties to you for not participating or not answering a question. Neither your participation nor your responses will affect your ability to receive Land O'Lakes assistance now or in the future.</p> |                   |    |
| <b>Permission Question:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |    |
| <p><i>Before we begin, do you have any questions about the purpose of the evaluation or what will happen to the information? If it's ok, I would like to audio record the interview for note-taking accuracy. The only people who will have access to the recordings and interview notes are project researchers, who have taken a strict oath of confidentiality.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |    |
| Do I have your permission to conduct this interview?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes               | No |
| Do I have your permission to record this interview?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Yes               | No |

*If at any point you want me to turn off the tape recorder, please let me know and I'll be happy to comply*

## **SECTION 0: BACKGROUND ON COOPERATIVE AND ENGAGEMENT WITH MERCADO**

**[Transition]: Enumerator: First, we would like to talk to you about your cooperative and your engagement with the MERCADO project**

|           |                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                 |                                                           |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Co_back1  | Please provide a brief background on the cooperative/milk collection center<br><i>Please describe (open-ended)</i> <ul style="list-style-type: none"> <li>• Year of inception</li> <li>• Motivation for start-up</li> </ul>                                                                                                                                                               |                                                                                                                 |                                                           |
| Co_back2  | When and how did you begin work with the MERCADO project?<br><i>Please describe (open-ended)</i> <ul style="list-style-type: none"> <li>• Year began work with MERCADO project</li> <li>• Motivation for work with MERCADO project</li> <li>• Major evolutions in nature or scale of engagement with MERCADO</li> </ul>                                                                   |                                                                                                                 |                                                           |
| Co_train1 | What types of training has your cooperative/MCC business received in the last 12 months (July 1, 2018 – June 30, 2019) from any source?<br>0 No training<br>1 Milk handling<br>2 Milk processing<br>3 Milk storage and cooling<br>4 Food safety training<br>5 Milk testing training<br>6 Business operations/Financial management<br>7 Other, specify<br>-99 Do not know/refuse to answer | *Select all that apply<br>*Ensure that if “0” or “99” are chosen, no other option is chosen                     | Indicators:<br>#36, #37,<br>#38, #39,<br>#40, #42,<br>#43 |
| Co_train2 | From whom did your business receive this training in the last 12 months (July 1, 2018 – June 30 2019)?<br>1 Government agencies (national, state, local)<br>2 Non-governmental organizations<br>3 Land O’ Lakes<br>4 Other private companies<br>5 Input suppliers<br>6 Business development service providers<br>7 Own staff<br>8 Other, specify<br>-99 Do not know/refuse to answer      | *Ask if co_train1 = 1 -7<br>*Select all that apply<br>*Ensure that if “99” is chosen, no other option is chosen |                                                           |
| Co_train3 | Thinking specifically about the training you’ve participated in from Land O’Lakes in the last 2 years, what were the training topics? what were your key learnings? Is there anything that you especially liked about this training? Are there any areas where you need more support?<br><i>Please describe (open-ended)</i>                                                              | *Ask if co-train2 = 3                                                                                           |                                                           |

## SECTION 1: RECORD KEEPING

**[Transition]: Enumerator: Thank you! Now we want to ask you about the records you keep for your business**

| VARIABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                                 | PMP INDICATOR        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------|
| Co_record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Did your business keep any kinds of records or logs in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                                                                                                                                                                                     | *Select only one option                                                 | Indicators: #37; #18 |
| Co_record1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Why do you not keep any kinds of records or logs for your business?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                                                                                                                                                                               | *Ask if co_record=2                                                     |                      |
| Co_record2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | What types of records did you keep in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Income and expense ledger<br>2 Production ledgers ( <i>tracks inputs vs outputs</i> )<br>3 Labor<br>4 Equipment<br>5 Long range budgeting<br>6 rejections of incoming milk<br>7 Rejections of outgoing milk<br>8 Monthly cash flow statement<br>9 Milk collection from suppliers<br>10 Milk sales<br>11 Other, specify<br>-99 Do not know/refuse to answer | *Ask if co_record = 1<br>*Select all that apply<br>*Prompt with options | Indicator: #18       |
| Co_record3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Did you start or change the way to keep records as a result of any training you received? If so, what training? How did it change?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                                                                                                                | *Ask if co_train1 = 6                                                   |                      |
| <b>[Transition]: Enumerator: We want to really understand the revenues and costs of your cooperative to understand how your business is doing. In order to do this, we need to ask you specific questions about your costs and revenues over the last year. If you have a monthly cash flow statement from last year (July 1, 2018 – June 30, 2019), it would be helpful if you get out the copy of your monthly cash flow statement so that we can talk about exact values. If not, then please try to provide accurate values.</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                         |                      |
| Co_cash2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Is it possible to provide a copy of the monthly cash flow statement from last year (July 1, 2018 – June 30, 2019)?<br>1 Yes                                                                                                                                                                                                                                                                                                                              | *Ask if co_record2 = 8<br>*Select only one option                       | Indicator: #18       |

| VARIABLE                                                                                                                                                          |                                                                                                                                                 | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                              | PMP INDICATOR |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                                   | 2 No<br>-99 Do not know/refuse to answer                                                                                                        |                                                                                                                                                                                                                                                                                                                                      |               |
| <b>[Enumerator Instruction]:</b> If “co_cash2 = 1” then fill the following questions using the monthly cash flow statement, else ask the respondent and the fill: |                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                      |               |
| Co_othercost_record1                                                                                                                                              | Does the cash flow statement have information on cost of utilities?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                        | *Ask if co_record2 = 8<br>*Select only one option                                                                                                                                                                                                                                                                                    |               |
| Co_othercost1                                                                                                                                                     | What was the <b>average monthly cost</b> of utilities for your business over the last 12 months (July 1, 2018 – June 30, 2019)?                 | *If co_othercost_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Ensure average monthly price in last 12 months is quoted<br>*Explain that utilities include costs for fuel, electricity and water<br>*Enter -99 if don't know/refuse<br>*Enter 0 if this expense was not incurred<br>*Enter in Metical |               |
| Co_othercost_record2                                                                                                                                              | Does the cash flow statement have information on rental costs of land/buildings/machinery?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Ask if co_record2 = 8<br>*Select only one option                                                                                                                                                                                                                                                                                    |               |
| Co_othercost2                                                                                                                                                     | What was the total rental cost of lands and buildings in the last 12 months (July 1, 2018 – June 30, 2019)?                                     | *If co_othercost_record2 = 1 then fill from record book, else ask respondent and fill out<br>*Ensure total cost in last 12 months is quoted<br>*Enter -99 if don't know/refuse<br>*Enter 0 if this expense was not incurred<br>*Enter in Metical                                                                                     |               |
| Co_othercost3                                                                                                                                                     | What was the total rental cost of machinery, vehicles and equipment (including storage equipment) in the                                        | *If co_othercost_record2 = 1 then fill from record book,                                                                                                                                                                                                                                                                             |               |

| VARIABLE             |                                                                                                                                                                                                                                                       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                   | PMP INDICATOR |
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|                      | last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                                                        | <p>else ask respondent and fill out</p> <p>*Ensure total cost in last 12 months is quoted</p> <p>*Enter -99 if don't know/refuse</p> <p>*Enter 0 if this expense was not incurred</p> <p>*Enter in Metical</p> <p>*Explain: this could include milk testing equipment</p> |               |
| Co_othercost_record3 | <p>Does the cash flow statement have information on maintenance and repair costs?</p> <p>1 Yes</p> <p>2 No</p> <p>-99 Do not know/refuse to answer</p>                                                                                                | <p>*Ask if co_record2 = 8</p> <p>*Select only one option</p>                                                                                                                                                                                                              |               |
| Co_othercost4        | <p>What was the total cost of maintenance and repair in the last 12 months (July 1, 2018 – June 30, 2019)?</p>                                                                                                                                        | <p>*If co_othercost_record3 = 1 then fill from record book, else ask respondent and fill out</p> <p>*Ensure total cost in last 12 months is quoted</p> <p>*Enter -99 if don't know/refuse</p> <p>*Enter 0 if this expense was not incurred</p> <p>*Enter in Metical</p>   |               |
| Co_othercost_record4 | <p>Does the cash flow statement have information on cost of consumables, including milk utensils, office consumables and other consumables?</p> <p>1 Yes</p> <p>2 No</p> <p>-99 Do not know/refuse to answer</p>                                      | <p>*Ask if co_record2 = 8</p> <p>*Select only one option</p>                                                                                                                                                                                                              |               |
| Co_othercost5        | <p>What was the total cost of consumables including milk utensils, milk quality testing consumables, office consumables, any consumables you provide to your members and other consumables, in the last 12 months (July 1, 2018 – June 30, 2019)?</p> | <p>*If co_othercost_record4 = 1 then fill from record book, else ask respondent and fill out</p> <p>*Ensure total cost in last 12 months is quoted</p> <p>*Enter -99 if don't know/refuse</p> <p>*Enter 0 if this expense was not incurred</p>                            |               |

| VARIABLE                                                                                                                                                                           |                                                                                                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                                                      | PMP INDICATOR |
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|                                                                                                                                                                                    |                                                                                                                                                                                                                          | *Enter in Metical<br>*Explain: this could include costs for milk utensils                    |               |
| Co_othercost_record6                                                                                                                                                               | Does the cash flow statement have information on your business transportation costs (i.e. fuel, taxis, etc.)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                       | *Ask if co_record2 = 8<br>*Select only one option                                            |               |
| <b>[Enumerator Instruction] : If co_othercost_record6 = 1, then for questions co_othercost7 – co_othercost8, fill from the record book ; else ask respondent and then fill out</b> |                                                                                                                                                                                                                          |                                                                                              |               |
| Co_othercost7                                                                                                                                                                      | What is the average monthly cost of transportation for your business in the last rainy season (November 2018 through April 2019)?                                                                                        | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer and "0" if no costs incurred |               |
| Co_othercost8                                                                                                                                                                      | What is the <b>average monthly cost</b> of transportation for your business in the last dry season (May through October 2018)?                                                                                           | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer                              |               |
| Co_othercost9_1                                                                                                                                                                    | Other than staff costs and milk purchase costs, that we will touch on later, what other costs of production in the last 12 months have we not included in the previous questions?<br><i>Please describe (open ended)</i> |                                                                                              |               |
| Co_othercost9_2                                                                                                                                                                    | Does the cash flow statement have information on these other costs?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                 | *Ask if co_record2 = 8<br>*Select only one option                                            |               |
| Co_othercost9_3                                                                                                                                                                    | Which other costs does the cash flow have information about?<br><i>Please describe (open ended)</i>                                                                                                                      | *Ask if co_othercost9_2 = 1                                                                  |               |
| Co_othercost9_4                                                                                                                                                                    | What were the other total costs of production that we have not included in the last 12 months (July 1, 2018 – June 30, 2018)?                                                                                            | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer                              |               |



## SECTION 2: PROCUREMENT AND SALES

**[Transition]** Enumerator: Thank you! Now we want to talk to you about your procurement and sales of milk.

| VARIABLE                                                                                                                                                                            |                                                                                                                                                        | ENUMERATOR INSTRUCTIONS                                                                                                                                       | PMP INDICATOR |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Co_procure_0                                                                                                                                                                        | Did you collect milk from suppliers in the past 12 months between July 31, 2018 to June 30, 2019?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option                                                                                                                                       |               |
| Co_procure_0_1                                                                                                                                                                      | Why did you not collect milk from suppliers in the past 12 months between July 31, 2018 to June 30, 2019?<br><i>Please describe (open ended)</i>       | *Ask if co_procure_0 = 2 or -99. Then thank respondent and end the interview                                                                                  |               |
| <b>[Transition]</b> Enumerator: Let's first talk about your procurement of milk<br><b>[Instruction]</b> Enumerator: Ask the remaining questions in this section if co_procure_0 = 1 |                                                                                                                                                        |                                                                                                                                                               |               |
| Co_procure_record 1                                                                                                                                                                 | Does the record book have information on milk procurement?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                        | *Select only one option<br>*Ask if co_record2 = 9                                                                                                             |               |
| Co_procure_1                                                                                                                                                                        | How many suppliers regularly supplied the business during the dry season (May through October 2018)?                                                   | *If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter -99 if do not know/refuse to answer                         |               |
| Co_procure_2                                                                                                                                                                        | How many suppliers regularly supplied the business during the rainy season (November 2018 through April 2019)?                                         | *Enter -99 if do not know/refuse to answer<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out                         |               |
| Co_procure_3                                                                                                                                                                        | What volume of milk did the business procured from suppliers in the last dry season (May through October 2018)?                                        | *Enter in liters<br>*Enter -99 if do not know/refuse to answer<br>*If co_procure_record1 = 1 then fill from record book, else ask the respondent and fill out | Indicator: #1 |
| Co_procure_4                                                                                                                                                                        | What was the average price paid to suppliers per liter of milk, in the last dry season (May through October 2018)?                                     | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer                                                                                               |               |

| VARIABLE     |                                                                                                                                                    | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                        | PMP INDICATOR  |
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|              |                                                                                                                                                    | *If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out                                                                                                                                                        |                |
| Co_procure_5 | What is the total value of milk procured from suppliers, in the last dry season (May through October 2018)?                                        | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Check to ensure the total value is the product of co_procure_3 and co_procure_4 | Indicator: #1  |
| Co_procure_6 | What volume of milk has the business procured from suppliers in the last rainy season (November 2018 through April 2019),                          | *Enter in liters<br>*Enter -99 if do not know/refuse to answer<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out                                                                                      | Indicator: #1  |
| Co_procure_7 | What was the average price paid to suppliers per liter of milk in the rainy season (November 2018 through April 2019)?                             | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out                                                                                     |                |
| Co_procure_8 | What is the total value of milk procured from suppliers, in the last rainy season (November 2018 through April 2019)?                              | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Check to ensure the total value is the product of co_procure_6 and co_procure_7 | Indicator: #1  |
| Co_procure_9 | Does the business have any formal agreement with any of your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No | *Select only one option                                                                                                                                                                                                                        | Indicator: #23 |

| VARIABLE         |                                                                                                                                                                                                                         | ENUMERATOR INSTRUCTIONS                                                                                                                                           | PMP INDICATOR  |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                  | -99 Do not know/refuse to answer                                                                                                                                                                                        |                                                                                                                                                                   |                |
| Co_procure_9_1   | How many agreements did you have with your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                         | *Ask if co_procure_9 = 1<br>*Enter -99 if do not know/refuse to answer<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out | Indicator: #23 |
| Co_procure_9_1_1 | Can you describe these agreements?<br><i>Please describe (open-ended)</i>                                                                                                                                               | *Ask if co_procure_9 = 1                                                                                                                                          |                |
| Co_procure_9_2   | Did you provide any support services to your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                  | *Select only one option<br>*Explain: Services could include training, technical support, transport services etc.                                                  |                |
| Co_procure_9_2a  | Can you explain the types of support services you offered?<br><i>Please describe (open-ended)</i>                                                                                                                       | *Ask if co_procure_9_2 = 1                                                                                                                                        |                |
| Co_procure_9_2b  | Why do you not provide support services to your suppliers?<br><i>Please describe (open-ended)</i>                                                                                                                       | *Ask if co_procure_9_2 = 2                                                                                                                                        |                |
| Co_procure_10    | How is the milk transported from your suppliers?<br>1 Suppliers come to our doorstep<br>2 Business travels to buy milk from seller<br>3 Other, specify<br>-99 Do not know/refuse to answer                              | *Select all that apply<br>*Ensure that if -99 is chosen, no other option is chosen                                                                                |                |
| Co_procure_11    | What challenges, if any, does the business face in procurement of milk?<br><i>Please describe (open-ended)</i>                                                                                                          |                                                                                                                                                                   |                |
| Co_procure_12    | How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address any milk procurement challenges?<br><i>Please describe (open-ended)</i> | *If no challenges, skip question                                                                                                                                  |                |
| Co_procure_13    | What does the business think will be necessary to successfully tackle challenges in milk procurement?<br><i>Please describe (open-ended)</i>                                                                            | *If no challenges, skip question                                                                                                                                  |                |

| VARIABLE                                                                                                                       |                                                                                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                               | PMP INDICATOR |
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| Co_procure_14                                                                                                                  | Have you seen any changes in milk procurement since your participation in the MERCADO project, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer         | *Select one option<br>*If co_procure_14 = -99, go to co_procure_16    |               |
| Co_procure_15                                                                                                                  | How do you think milk procurement changed because of the MERCADO project?<br><i>Please describe (open ended)</i>                                                                                         |                                                                       |               |
| Co_procure_16                                                                                                                  | How was the volume of milk procured from suppliers been impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                      | *Select one option                                                    |               |
| Co_procure_17                                                                                                                  | How many liters per month did your procurement decrease as a result of Cyclone Idai?                                                                                                                     | *Ask if co_procure_16=2<br>*Enter -99 if do not know/refuse to answer |               |
| Co_procure_18                                                                                                                  | How was the price paid to suppliers impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                                          | *Select one option                                                    |               |
| Co_procure_19                                                                                                                  | How many meticals/liter did the price paid to suppliers decrease as a result of Cyclone Idai?                                                                                                            | *Ask if co_procure_18=2<br>*Enter -99 if do not know/refuse to answer |               |
| Co_procure_20                                                                                                                  | How many meticals/liter did the price paid to suppliers increase as a result of Cyclone Idai?                                                                                                            | *Ask if co_procure_18=1<br>*Enter -99 if do not know/refuse to answer |               |
| Co_procure_21                                                                                                                  | Have you faced other challenges in procurement of milk as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term?<br><i>Please describe (open-ended)</i> |                                                                       |               |
| <b>[Transition]: Enumerator: Great! Now, let's talk specifically about sales of raw milk. Please only think about raw milk</b> |                                                                                                                                                                                                          |                                                                       |               |
| Co_sales_record1                                                                                                               | Does the record book have information on raw milk sales?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                            | *Select only one option<br>*Ask if co_record2 = 10                    |               |

| VARIABLE          |                                                                                                                                                                                                                                 |                           |                          | ENUMERATOR INSTRUCTIONS                                                                                                                                                                | PMP INDICATOR |
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| co_sales_2_1      | Who did you sell your raw milk to in the last dry season (May through October 2018)?<br>1 Processors<br>2 Retailers<br>3 Direct sales to consumers<br>4 Other businesss<br>5 Other, specify<br>-99 Do not know/refuse to answer |                           |                          | *Select all that appy<br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out                                                                         |               |
| Co_sales_2_1_name | Please specify name (s):                                                                                                                                                                                                        |                           |                          | *Ask if co_sales_2_1 = 2                                                                                                                                                               |               |
| Co_sales_3_1      | In the last dry season (May through October 2018), who has the business sold raw milk to, what was the volume sold, and what price did they pay?                                                                                |                           |                          | *If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter “0” if no sales                                                                        |               |
|                   | Buyer Type                                                                                                                                                                                                                      | Quantity Sold (in liters) | Price/liter (in Metical) |                                                                                                                                                                                        |               |
|                   | Processors                                                                                                                                                                                                                      |                           |                          |                                                                                                                                                                                        |               |
|                   | Retailers                                                                                                                                                                                                                       |                           |                          |                                                                                                                                                                                        |               |
|                   | Direct sales to consumers                                                                                                                                                                                                       |                           |                          |                                                                                                                                                                                        |               |
|                   | Other businesses                                                                                                                                                                                                                |                           |                          |                                                                                                                                                                                        |               |
| Other, specify    |                                                                                                                                                                                                                                 |                           |                          |                                                                                                                                                                                        |               |
| Co_sales_6_1      | What was the business’s <b>total volume</b> of raw milk sales in the last dry season (May through October 2018)?                                                                                                                |                           |                          | *Enter in liters<br>*Enter 0 if no sales<br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out                                                      | Indicator: #2 |
| Co_sales_7_1      | What is the average price received from buyers per liter of raw milk in the last dry season (May through October 2018)?                                                                                                         |                           |                          | *Enter in price/liter of milk sold to processors<br>*Enter in Metical<br>*Enter 0 if no sales<br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out | Indicator: #1 |
| Co_sales_5_1      | What was the business’s <b>total value</b> of raw milk sales in the last dry season (May through October 2018)?                                                                                                                 |                           |                          | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*Enter 0 if no sales<br>*If co_sales_record1 = 1 then fill from record                                              | Indicator: #1 |

| VARIABLE          |                                                                                                                                                                                                                                            | ENUMERATOR INSTRUCTIONS                                                                                                                                                          | PMP INDICATOR |
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|                   |                                                                                                                                                                                                                                            | book, else ask respondent and fill out                                                                                                                                           |               |
| Co_sales_5_1      | What was the business's <b>total value</b> of raw milk sales in the last dry season (May through October 2018)?                                                                                                                            | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*Enter 0 if no sales<br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out | Indicator: #1 |
| co_sales_2_2      | Who did you sell your raw milk to in the last rainy season (November 2018 through April 2019)?<br>1 Processors<br>2 Retailers<br>3 Direct sales to consumers<br>4 Other businesses<br>5 Other, specify<br>-99 Do not know/refuse to answer | *Select all that apply                                                                                                                                                           |               |
| Co_sales_2_2_name | Please specify name:                                                                                                                                                                                                                       | *Ask if co_sales_2 = 2                                                                                                                                                           |               |
| Co_sales_3_2      | In the last rainy season (November 2018 through April 2019), who has the business sold raw milk to, what was the volume sold, and what price did they pay?                                                                                 | *If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter "0" if no sales                                                                  |               |
|                   | <b>Buyer Type</b>                                                                                                                                                                                                                          |                                                                                                                                                                                  |               |
|                   | <b>Quantity Sold (in liters)</b>                                                                                                                                                                                                           |                                                                                                                                                                                  |               |
|                   | <b>Price/liter (in Metical)</b>                                                                                                                                                                                                            |                                                                                                                                                                                  |               |
|                   | Processors                                                                                                                                                                                                                                 |                                                                                                                                                                                  |               |
|                   | Retailers                                                                                                                                                                                                                                  |                                                                                                                                                                                  |               |
|                   | Direct sales to consumers                                                                                                                                                                                                                  |                                                                                                                                                                                  |               |
|                   | Other businesses                                                                                                                                                                                                                           |                                                                                                                                                                                  |               |
|                   | Other, specify                                                                                                                                                                                                                             |                                                                                                                                                                                  |               |
| Co_sales_6_2      | What was the business's <b>total volume</b> of raw milk sales in the last rainy season (November 2018 through April 2019)?                                                                                                                 | *Enter in liters<br>*Enter 0 if no sales<br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out                                                |               |
| Co_sales_7_2      | What is the average price received from buyers per liter of raw milk in the last rainy season (November 2018 through April 2019)?                                                                                                          | *Enter in price/liter of milk sold to processors<br>*Enter in Metical<br>*Enter 0 if no sales                                                                                    | Indicator: #1 |

| VARIABLE     |                                                                                                                                                                                                                            | ENUMERATOR INSTRUCTIONS                                                                                                                                                          | PMP INDICATOR  |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|              |                                                                                                                                                                                                                            | *If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out                                                                                            |                |
| Co_sales_5_2 | What was the business's <b>total value</b> of raw milk sales in the last rainy season (November 2018 through April 2019)?                                                                                                  | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*Enter 0 if no sales<br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out | Indicator: #1  |
| Co_sales_14  | Does the business have any agreement with a buyer in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                               | *Select only one option                                                                                                                                                          | Indicator: #23 |
| Co_sales_15  | How many agreements did you have with buyers in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                         | *Ask if co_sales_14 = 1<br>*Enter -99 if do not know/refuse to answer                                                                                                            | Indicator: #23 |
| Co_sales_16  | Can you describe these agreements?<br><i>Please describe (open-ended)</i>                                                                                                                                                  | *Ask if co_sales_14=1                                                                                                                                                            |                |
| Co_sales_17  | How is the milk transported to your buyers?<br>1 Buyer (processor etc.) comes to our doorstep<br>2 Business travels to sell milk to buyer<br>3 Other, specify<br>-99 Do not know/refuse to answer                          | *Select all that apply<br>*Ensure that if "-99" is chosen, no other option is chosen                                                                                             |                |
| Co_sales_18  | What challenges, if any, does the business face in sales and marketing of milk/milk products?<br><i>Please describe (open-ended)</i>                                                                                       |                                                                                                                                                                                  |                |
| Co_sales_19  | How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address any sales and marketing challenges?<br><i>Please describe (open-ended)</i> | *If no challenges, skip question                                                                                                                                                 |                |
| Co_sales_20  | What does the business think will be necessary to successfully tackle challenges related to selling milk?<br><i>Please describe (open-ended)</i>                                                                           | *If no challenges, skip question                                                                                                                                                 |                |

| VARIABLE      |                                                                                                                                                                                                         | ENUMERATOR INSTRUCTIONS                                             | PMP INDICATOR |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------|
| Co_sales_21   | Have you seen any changes in milk/milk product sales since your participation in the MERCADO project, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer | *Select one option<br>*If co_sales_21 = -99, go to co_sales_23      |               |
| Co_sales_22   | Why do you think milk sales changed because of the MERCADO project?<br><i>Please describe (open ended)</i>                                                                                              |                                                                     |               |
| Co_sales_23   | How was the volume of milk impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                                                  | *Select one option                                                  | Indicator: #1 |
| Co_sales_24   | How many liters per month did your sales of milk/milk products decrease because of Cyclone Idai?                                                                                                        | *Ask if co_sales_23=2<br>*Enter -99 if do not know/refuse to answer |               |
| Co_sales_25   | How was the price received for your milk impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                                    | *Selection one option                                               | Indicator: #1 |
| Co_sales_26   | How many meticals/liter of milk did the price received by you decrease because of Cyclone Idai?                                                                                                         | *Ask if co_sales_25=2<br>*Enter -99 if do not know/refuse to answer |               |
| Co_sales_26_1 | How many meticals/liter of milk did the price received by you increase because of Cyclone Idai?                                                                                                         | *Ask if co_sales_25=1<br>*Enter -99 if do not know/refuse to answer |               |
| Co_sales_27   | What other challenges have you faced in milk sales as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term?<br><i>Please describe (open-ended)</i>    |                                                                     |               |

### **SECTION 3: MILK QUALITY TESTING**

**[Transition]: Enumerator: Now let's talk about milk quality checks and milk testing on incoming milk**



| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                                                                                                | ENUMERATOR INSTRUCTIONS                                                                                                               | PMP                             |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Co_qual_1   | Does the business do any quality testing on incoming milk you procure?<br>9 Yes<br>10 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                                                                                                                   | *Select only one option<br>*If co_qual_1 = -99, go to co_qual_5                                                                       | Indicators:<br>#25, #26         |
| Co_qual_1_1 | Why do you not do any quality testing on incoming milk?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                                                                                                                                                                 | *Ask if co_qual_1 = 2                                                                                                                 |                                 |
| Co_qual_2   | What do you test for?<br>6 Water adulteration<br>7 Bacteria<br>8 Butter and fat content<br>9 Antibiotic residue<br>10 pH testing<br>11 Testing for mastitis<br>12 Testing for freshness of milk<br>13 Other, specify<br>-99 Do not know/refuse to answer                                                                                                                                                                       | *Select all that apply<br>*Ask if co_qual_1=1<br>*Prompt with responses<br>*Ensure that if “-99” is chosen, no other option is chosen | Indicators:<br>#25, #26         |
| Co_qual_3   | Do you test all deliveries, do random testing, or test on an ad hoc basis?<br>1 Test all deliveries<br>2 Random check<br>3 Ad-hoc/judgement basis<br>4 Other, specify<br>-99 Do not know/refuse to answer                                                                                                                                                                                                                      | *Select only one option<br>*Ask if co_qual_1=1                                                                                        | Indicators:<br>#25, #26         |
| Co_qual_4   | What instruments did your business use for testing milk during the collection process in the last 12 months (July 1, 2018 – June 30, 2019)?<br>0 No instruments<br>1 Taste, smell, visual observation<br>2 Milk density (use of lactometer)<br>3 Clot-on boiling tests<br>4 Gerber tests for fat<br>5 pH tests level of acidity (lactic acid in mill)<br>6 Temperature<br>7 Other, specify<br>-99 Do not know/refuse to answer | *Select all that apply<br>*Read from list<br>*Ensure if “0” or “99” options are chosen, no other option is selected                   | Indicators:<br>#25, #26         |
| Co_qual_5   | Has your business rejected any milk on safety and/or quality grounds in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                                                                | *Select only one option                                                                                                               | Indicators:<br>#25, #26,<br>#30 |

|            |                                                                                                                                                                    |                                                                                                                                                                                                                                           |                                 |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Co_qual_6  | On average, what percentage of incoming milk did the business reject on quality grounds during the previous dry season (May through October 2018)?                 | *Ask if co_qual_5= 1<br>*Ensure only numbers between 0 and 100 can be entered<br>*Enter -99 if do not know/refuse<br>*If they have records for this, then ask them to show their records and fill out from record, else ask the question  | Indicators:<br>#25, #26,<br>#21 |
| Co_qual_7  | On average, what percentage of incoming milk did the business reject on quality grounds during the last rainy season (November 2018 through April 2019_?           | *Ask if co_qual_5= 1<br>*Ensure only numbers between 0 and 100 can be entered<br>*Enter -99 if do not know/refuse<br>*If there have records for this, then ask them to show their records and fill out from record, else ask the question | Indicators:<br>#25, #26,<br>#21 |
| Co_qual_8  | Does the business adjust the price paid for milk on the basis of any quality parameters (e.g. milk freshness)<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option                                                                                                                                                                                                                   |                                 |
| Co_qual_9  | How is the price adjusted?<br><i>Please describe (open-ended)</i>                                                                                                  | *Ask if co_qual_8=1                                                                                                                                                                                                                       |                                 |
| Co_qual10  | Did you make any change to your milk-testing procedures based on any training you received? If so, what training? How? <i>Please describe (open-ended)</i>         | *Ask if co_qual_1=1 and co_train1=5                                                                                                                                                                                                       |                                 |
| Co_qual_11 | Is any of the milk you sell rejected on quality grounds?<br><i>Please describe (open ended)</i>                                                                    |                                                                                                                                                                                                                                           |                                 |

## SECTION 4: EQUIPMENT, FINANCE, AND INVESTMENTS

**[Transition]:** Enumerator: Now, we want to talk about your equipment, financing, and investments

| VARIABLE                                                                                                                                                                                 |                                                                                                                                                                                                                                | ENUMERATOR INSTRUCTIONS                                                                                      | PMP INDICATOR             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>[Transition]:</b> Enumerator: Let's first talk about the equipment you currently own                                                                                                  |                                                                                                                                                                                                                                |                                                                                                              |                           |
| Co equip_1                                                                                                                                                                               | What types of major equipment and facilities do you have?<br>1 Bulk milk tank<br>2 Pasteurizer<br>3 Chilling system<br>4 Bulk fridge retails<br>5 Value-adding technology (please specify)<br>-99 Do not know/refuse to answer | *Select all that apply<br>*Prompt with options<br>*Ensure that if "-99" is chosen, no other option is chosen | Indicators: #13, #14, #27 |
| <b>[Enumerator instruction]:</b> For each <<type of major equipment>>, ask the following questions. Ask questions "co equip_2 – co equip_6" for applicable options selected in "equip_1" |                                                                                                                                                                                                                                |                                                                                                              |                           |
| Co equip_2\$1<br>Co equip_2\$2<br>Co equip_2\$3<br>Co equip_2\$4<br>Co equip_2\$5                                                                                                        | How many of <<type of major equipment>> do you own?                                                                                                                                                                            | *Enter -99 if do not know/refuse to answer                                                                   |                           |
| Co equip_3\$1<br>Co equip_3\$2<br>Co equip_3\$3<br>Co equip_3\$4<br>Co equip_3\$5                                                                                                        | Is the <<type of major equipment>> currently in working order?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                            | *Select only one option                                                                                      |                           |
| Co equip_4\$1<br>Co equip_4\$2<br>Co equip_4\$3<br>Co equip_4\$4<br>Co equip_4\$5                                                                                                        | What is the total capacity of <<type of major equipment>> in the last 12 months (July 1, 2018 – June 30, 2019)? (in m <sup>3</sup> )                                                                                           | *Enter -99 if do not know/refuse to answer                                                                   | Indicator: #27            |
| Co equip_5\$1<br>Co equip_5\$2<br>Co equip_5\$3<br>Co equip_5\$4<br>Co equip_5\$5                                                                                                        | In what year was <<type of major equipment>> installed?                                                                                                                                                                        | *Enter -99 if do not know/refuse to answer                                                                   | Indicator: #27            |
| Co equip_6                                                                                                                                                                               | Have you seen any change in purchase or improvement of any of the equipment you just talked about since participation in the MERCADO project, if at all?<br><i>Please describe (open-ended)</i>                                |                                                                                                              |                           |

| VARIABLE                                                                                |                                                                                                                                                                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                 | PMP INDICATOR  |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>[Transition]: Enumerator: Now I want to ask you questions about your investments</b> |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                         |                |
| Co_invest_1                                                                             | Did your business make any investments in your dairy enterprise in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                               | *Select only one option                                                                                                                                                                                                                                                 | Indicator: #31 |
| Co_invest_2                                                                             | What investments did the business make?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                                           | *Ask if co-invest_1=1                                                                                                                                                                                                                                                   |                |
| Co_invest_3                                                                             | In total, how much did your business spend in new investments in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                      | *Ask if co-invest_1=1<br>*Explain that this could mean expenditure on new machinery, new software, new marketing investments, new vehicles etc.<br>*Enter -99 if don't know/refuse<br>*If multiple investments were made, enter total amount invested in last 12 months | Indicator: #31 |
| Co_invest_4                                                                             | What was the main source of financing for the investments in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Self-financed<br>2 Informal sources (family, neighbours, friends)<br>3 Formal loans (banks etc.)<br>4 Grant<br>5 Other, specify<br>-99 Do not know/refuse to answer | *Ask if co-invest_1=1<br>*Select only one option                                                                                                                                                                                                                        |                |
| Co_invest_5                                                                             | Does the business have any specific plans to invest in new equipment in the coming year?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                            | *Select only one option                                                                                                                                                                                                                                                 |                |
| <b>[Transition]: Enumerator: Great! Now, let's talk about your financing and credit</b> |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                         |                |

| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                           | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                     | PMP INDICATOR  |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Co_credit_1 | <p>Did your business request or receive credit for any production costs in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <p>1 Yes, applied and received<br/> 2 Yes, applied and did not receive<br/> 3 No have not applied<br/> -99 Do not know/refuse to answer</p>                                                                             | <p>*Select only one option<br/> *Ensure that if “-99” is chosen, no other option is chosen<br/> *If co_credit_1 = 3 OR co_credit_1 = -99, go to co_credit_8<br/> *If co_credit_1 = 1, go to co_credit_4</p> | Indicator: #33 |
| Co_credit_2 | <p>Why did your business not receive any loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <p>1 No formal financial institution present<br/> 2 Lack of collateral<br/> 3 High interest rate<br/> 4 Other, specify<br/> -99 Do not know/refuse to answer</p>                                                             | <p>*Ask if co_credit_1 = 2<br/> *Select all that apply<br/> *Ensure that if “-99” is chosen, no other option is chosen</p>                                                                                  |                |
| Co_credit_3 | <p>What were the primary purposes for obtaining loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <p>1 Buying equipment for business<br/> 2 Managing short-term cash shortage<br/> 3 Managing any unplanned shock to business<br/> 4 Business expansion<br/> 5 Other, specify<br/> -99 Do not know/refuse to answer</p> | <p>*Ask if co_credit_1 = 1<br/> *Select all that apply<br/> *Ensure that if “-99” is chosen, no other option is chosen</p>                                                                                  |                |
| Co_credit_4 | <p>What is the total value of loans from formal sources that your business obtained in the last 12 months (July 1, 2018 – June 30, 2019)?</p>                                                                                                                                                                                                             | <p>*Ask if co_credit_1 = 1<br/> *Enter in Metical<br/> *Enter -99 if do not know/refuse to answer</p>                                                                                                       | Indicator: #33 |
| Co_credit_5 | <p>At what interest rate did you borrow in the last 12 months (July 1, 2018 – June 30, 2019)? Think about only loans from formal sources</p>                                                                                                                                                                                                              | <p>*Ask if co_credit_1 = 1<br/> *Enter -99 if do not know/refuse to answer<br/> *If interest rates differ across various sources, enter average interest rate</p>                                           |                |
| Co_credit_6 | <p>What was the total cost of interest from paying off any business-related loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)?</p>                                                                                                                                                                                           | <p>*Ask if co_credit_1 = 1<br/> *Enter in Metical<br/> *Enter 0 if this expense was not incurred<br/> *Ensure total cost in last 12 months is quoted</p>                                                    |                |

| VARIABLE    |                                                                                                                                                                                                                                                                                                         | ENUMERATOR INSTRUCTIONS                                                                                                             | PMP INDICATOR |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Co_credit_7 | <p>Has your business used any other financial products in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <p>1 No</p> <p>2 Business insurance</p> <p>3 Livestock insurance</p> <p>4 Mutual funds</p> <p>5 Capital gain bonds</p> <p>6 Other, specify</p> <p>-99 Do not know/refuse to answer</p> | <p>*Select all that apply</p> <p>*Prompt with options</p> <p>*Ensure that if “-99” or “no” is chosen, no other option is chosen</p> |               |
| Co_credit_8 | <p>What financing challenges, if any, does the business face?</p> <p><i>Please describe (open-ended)</i></p>                                                                                                                                                                                            |                                                                                                                                     |               |
| Co_credit_9 | <p>How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address financing challenges?</p> <p><i>Please describe (open-ended)</i></p>                                                                                 | <p>*If no challenges, skip question</p>                                                                                             |               |
| Credit_10   | <p>What does the business think will be necessary to tackle these financing challenges?</p> <p><i>Please describe (open-ended)</i></p>                                                                                                                                                                  | <p>*If no challenges, skip question</p>                                                                                             |               |

## SECTION 5: STAFFING

**[Transition]:** Enumerator: Thank you! Now I want to ask you about your staffing.

| VARIABLE                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ENUMERATOR INSTRUCTIONS                                                                         | PMP INDICATOR        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------|
| Co_labor                                                                                                                                                                        | <p>Which of the following types of employees did your business employ in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <ul style="list-style-type: none"> <li>1 Full-time permanent – Male</li> <li>2 Full-time permanent – Female</li> <li>3 Part-time permanent – Male</li> <li>4 Part-time permanent – Female</li> <li>5 Full-time seasonal – Male</li> <li>6 Full-time seasonal – Female</li> <li>7 Part-time seasonal – Male</li> <li>8 Part-time seasonal – Female</li> <li>9 Other, specify</li> <li>-99 Do not know/refuse to answer</li> </ul> | <p>*Select all that apply</p> <p>*Ensure that if “-99” is chosen, no other option is chosen</p> |                      |
| <p><b>[Enumerator instruction]:</b> For each &lt;&lt;type of employee&gt;&gt; please answer the following questions. Ask only for applicable options selected in “co_labor”</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                 |                      |
| Co_labor0\$1<br>Co_labor0\$2<br>Co_labor0\$3<br>Co_labor0\$4<br>Co_labor0\$5<br>Co_labor0\$6<br>Co_labor0\$7<br>Co_labor0\$8<br>Co_labor0\$9                                    | <p>Does the record book have information on the &lt;&lt;type of employee&gt;&gt;</p> <ul style="list-style-type: none"> <li>1 Yes</li> <li>2 No</li> <li>-99 Do not know/refuse to answer</li> </ul>                                                                                                                                                                                                                                                                                                                                                             | <p>*Select only one option</p>                                                                  |                      |
| Co_labor1\$1<br>Co_labor1\$2<br>Co_labor1\$3<br>Co_labor1\$4<br>Co_labor1\$5<br>Co_labor1\$6<br>Co_labor1\$7<br>Co_labor1\$8<br>Co_labor1\$9                                    | <p>How many of the following &lt;&lt;types of employees&gt;&gt; did your business have in the last 12 months (July 1, 2018 – June 30, 2019)?</p>                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>*Enter -99 if number unknown but were employed at the business</p>                           |                      |
| Co_labor1_1\$1<br>Co_labor1_1\$2<br>Co_labor1_1\$3<br>Co_labor1_1\$4<br>Co_labor1_1\$5<br>Co_labor1_1\$6                                                                        | <p>How many <b>new</b> employees of the following &lt;&lt;types of employees&gt;&gt; did your business hire in the last 12 months (July 2018 – July 2019) as a result of participation in the MERCADO project?</p>                                                                                                                                                                                                                                                                                                                                               | <p>*Enter -99 if number unknown but were employed at the business</p>                           | <p>*INDICATOR #3</p> |

| VARIABLE                                                                                                                                     |                                                                                                                                                                                                                                   | ENUMERATOR INSTRUCTIONS                                                                                          | PMP INDICATOR |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------|
| Co_labor1_1\$7<br>Co_labor1_1\$8<br>Co_labor1_1\$9                                                                                           |                                                                                                                                                                                                                                   |                                                                                                                  |               |
| Co_labor2\$1<br>Co_labor2\$2<br>Co_labor2\$3<br>Co_labor2\$4<br>Co_labor2\$5<br>Co_labor2\$6<br>Co_labor2\$7<br>Co_labor2\$8<br>Co_labor2\$9 | On average, how many months in the year did your business hire <<types of employees>> in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                       | *Enter -99 if number unknown but were employed at the business                                                   |               |
| Co_labor3\$1<br>Co_labor3\$2<br>Co_labor3\$3<br>Co_labor3\$4<br>Co_labor3\$5<br>Co_labor3\$6<br>Co_labor3\$7<br>Co_labor3\$8<br>Co_labor3\$9 | On average, how many hours in a week did <<types of employees>> work in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                        | *Enter -99 if number unknown but were employed at the business                                                   |               |
| Co_labor4\$1<br>Co_labor4\$2<br>Co_labor4\$3<br>Co_labor4\$4<br>Co_labor4\$5<br>Co_labor4\$6<br>Co_labor4\$7<br>Co_labor4\$8<br>Co_labor4\$9 | What frequency of payment did you pay each <<type of employee>>?<br>1 Hourly<br>2 Daily<br>3 Weekly<br>4 Monthly<br>5 Yearly                                                                                                      | *Select only one option                                                                                          |               |
| Co_labor5\$1<br>Co_labor5\$2<br>Co_labor5\$3<br>Co_labor5\$4<br>Co_labor5\$5<br>Co_labor5\$6<br>Co_labor5\$7<br>Co_labor5\$8<br>Co_labor5\$9 | How much did you pay on average to each <<type of employee>> including benefits, in that type of payment? Think about the average wages paid only in the last 12 months. Please try to estimate if you do not know precise wages. | *Enter -99 if wages unknown<br>*If different wages paid, calculate and enter average amount<br>*Enter in Metical |               |



## **SECTION 6: ADDITIONAL OPEN-ENDED QUESTIONS**

1. What support from MERCADO has been most helpful to your business? Please explain.
2. What support from MERCADO has not been helpful? What needs does your business have that are still unmet? How can MERCADO improve their support to your business?
3. Are there any challenges specifically faced by women in participating in your business that are not faced by men? Are there any kinds of support provided to overcome these challenges that you know of?
4. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

## 1. Aggregation & Value Addition Facilities (Cooperatives) (Portuguese Version)

|                                                                              |                                                     |                      |                                                       |
|------------------------------------------------------------------------------|-----------------------------------------------------|----------------------|-------------------------------------------------------|
| Interviewer name<br><b>Nome do entrevistador</b>                             |                                                     |                      |                                                       |
| Interview date <b>Data da entrevista</b>                                     |                                                     |                      |                                                       |
| Interview time <b>Hora da Entrevista</b>                                     |                                                     |                      |                                                       |
| Cooperative/<br>Aggregation Name<br>name <b>Nome da Cooperativa/entidade</b> |                                                     |                      |                                                       |
| Respondent name<br><b>Nome do entrevistado</b>                               |                                                     |                      |                                                       |
| Respondent position/title<br><b>Cargo/título do entrevistado</b>             |                                                     |                      |                                                       |
| Respondent gender<br><b>Sexo do entrevistado</b>                             | 1 Male <b>Masculino</b><br>2 Female <b>Feminino</b> | <input type="text"/> | *Select only one option<br>selecione apenas uma opção |
| Contact information<br><b>Informações de contato</b>                         |                                                     |                      |                                                       |
| GPS coordinates:<br>latitude<br><b>Coordenadas GPS: latitude</b>             |                                                     |                      |                                                       |
| GPS coordinates:<br>longitude<br><b>Coordenadas GPS: longitude</b>           |                                                     |                      |                                                       |
| Province: <b>Província</b>                                                   | 1 Manica<br>2 Sofala                                | <input type="text"/> | *Select only one option<br>selecione apenas uma opção |
| District: <b>Distrito</b>                                                    |                                                     |                      |                                                       |
| Community:<br><b>comunidade</b>                                              |                                                     |                      |                                                       |
| <b>INTRODUCTION: INTRODUÇÃO</b>                                              |                                                     |                      |                                                       |

Thank you for taking the time today to meet with me/us. I work for IMPAQ International, a US-based research company. Joining me is \_\_\_\_\_, who works for \_\_\_\_\_. Land O'Lakes International Development has contracted IMPAQ International to collect data for an evaluation of the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project. **Obrigado por ter dispensado o seu tempo, para se encontrar comigo /connosco. Eu trabalho para a IMPAQ International, uma empresa de pesquisa sediada nos EUA. Comigo está o \_\_\_\_\_, que trabalha para \_\_\_\_\_. A Land O'Lakes International Development contratou a IMPAQ Internacional para recolher dados para uma avaliação do projeto de Expansão do Gado e das Oportunidades Leiteiras em Moçambique (chamado MERCADO).**

**Present letter of introduction. Apresenta a carta de introdução**

Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique. Your answers will be kept confidential and will not be used for any purpose other in a report that will help inform the dairy project being implemented by Land O' Lakes.

The interview should last about an hour. Participation is voluntary and you can choose not to take part. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer. Land O'Lakes would like you to feel free to be open and honest in your responses. Knowing the true situation in your dairy aggregation activities will help them provide better support to you in the future. There are no penalties to you for not participating or not answering a question. Neither your participation nor your responses will affect your ability to receive Land O'Lakes assistance now or in the future. **O nosso objetivo é captar uma ampla gama de pontos de vista que podem dar informações úteis as atividades da Land O'Lakes em Moçambique. As suas respostas serão mantidas em sigilo e não serão usadas para nenhum outro propósito além de um relatório que ajudará a informar o projeto de leite que está sendo implementado pela Land O'Lakes.**

**A entrevista deve durar cerca de uma hora. A participação é voluntária e você pode optar por não participar. Você também pode optar por recusar-se a responder a quaisquer perguntas com as quais não se sentir à vontade ou que não queira responder. Land O'Lakes gostaria que você se sentisse livre para ser aberto e honesto em suas respostas. Conhecer a verdadeira situação em suas atividades de produção de leite ajudará a fornecer um suporte melhor para você no futuro. Não há penalidades para você por não participar ou não responder a uma pergunta. Nem sua participação nem suas respostas afetarão sua capacidade de receber assistência da Land O'Lakes agora ou no futuro.**

**Permission Question:**

*Before we begin, do you have any questions about the purpose of the evaluation or what will happen to the information? If it's ok, I would like to audio record the interview for note-taking accuracy. The only people who will have access to the recordings and interview notes are project researchers, who have taken a strict oath of confidentiality. Antes de começar, você tem alguma dúvida sobre o propósito da avaliação ou o que acontecerá com a informação? Se estiver tudo bem, gostaria de gravá-la em áudio para precisão na anotação. As únicas pessoas que terão acesso às gravações e notas de entrevista são os pesquisadores do projeto, que fizeram um estrito juramento de confidencialidade.*

|                                                                                                                |               |                          |                                                           |
|----------------------------------------------------------------------------------------------------------------|---------------|--------------------------|-----------------------------------------------------------|
| Do I have your permission to conduct this interview? <i>Eu tenho sua permissão para fazer esta entrevista?</i> | 1 Yes<br>2 No | <input type="checkbox"/> | *Select only one option <b>selecione apenas uma opção</b> |
|----------------------------------------------------------------------------------------------------------------|---------------|--------------------------|-----------------------------------------------------------|



If the respondent says NO, thank him/her, terminate the survey and proceed to the next respondent on your list. **Se o entrevistado disser NÃO, agradeça, termina o questionário e prossiga para o próximo entrevistado**

*Do I have your permission to record this interview?*

**selecione apenas uma opção**

1 Yes

2 No

|\_|

\*Select only  
one option

**selecione  
apenas uma  
opção**



If the respondent says NO, turn off the tape recorder and do not record interview. **Se o entrevistado disser NÃO, desligue o gravador e não grave a entrevista**

## SECTION 0: BACKGROUND ON COOPERATIVE AND ENGAGEMENT WITH MERCADO

### SECÇÃO 0: HISTÓRIA DA COOPERATIVA E SEU ENVOLVIMENTO COM O MERCADO

**[Transition]:** Enumerator: *First, we would like to talk to you about your cooperative and your engagement with the MERCADO project* Inquiridor: *Primeiro, gostaríamos de conversar com você sobre seu negócio e seu engajamento com o projeto MERCADO*

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_back1 | <p>Please provide a brief background on the cooperative/milk collection center <b>Por favor, Faça uma breve descrição histórica sobre a cooperativa/centro de recolha de leite</b><br/><i>Please describe (open-ended) Por favor, descreva (em aberto)</i></p> <ul style="list-style-type: none"><li>• Year of inception <b>O ano de criação</b></li><li>• Motivation for start-up <b>A motivação para o arranque</b></li></ul>                                                                                                                                                                                                                                      |
| Co_back2 | <p>When and how did you begin work with the MERCADO project? <b>Quando e como você começou a trabalhar com o projecto MERCADO?</b><br/><i>Please describe (open-ended) Por favor, descreva (em aberto)</i></p> <ul style="list-style-type: none"><li>• Year began work with MERCADO project <b>Ano em que começou a trabalhar com o projecto MERCADO</b></li><li>• Motivation for work with MERCADO project <b>Qual foi a motivação para o trabalhar com o projecto MERCADO</b></li><li>• Major evolutions in nature or scale of engagement with MERCADO <b>Principais evoluções quer nos produtos quer na escala devido ao envolvimento com o MERCADO</b></li></ul> |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                  |                                                                                                                                                                                                                                         |
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| Co_train1 | <p>What types of training has your cooperative/MCC busniess received in the last 12 months (July 1, 2018 – June 30, 2019) from any source? <b>Que tipos de treinamento recebeu a sua Cooperativa/Centro de Recolha de Leite nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p> <p>1 No training → <b>co_record Nenhum treinamento</b></p> <p>2 Milk handling <b>manuseio do leite</b></p> <p>3 Milk processing <b>processamento de leite</b></p> <p>4 Milk storage and cooling <b>Armazenamento e resfrigeração de leite</b></p> <p>5 Food safety training <b>Treinamento em segurança de alimentos</b></p> <p>6 Milk testing training <b>Treinamento em testagem de leite</b></p> <p>7 Business operations/Financial management <b>Operações comerciais / gestão financeira</b></p> <p>8 Other, specify <b>Outros, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply<br/><b>Selecione tudo que se aplica</b></p> <p>*Ensure that if “0” or “99” are chosen, no other option is chosen<br/><b>Assegure-se que se “0” ou “99” for escolhido, nenhuma outra opção é escolhida</b></p> |
| Co_train2 | <p>From whom did your busniess receive this training in the last 12 months (July 1, 2018 – June 30 2019)? <b>De quem, o seu negócio, recebeu este treinamento nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p> <p>1 Government agencies (national, state, local) <b>Agências governamentais (nacionais, estaduais e locais)</b></p> <p>2 Non-governmental organizations <b>Organizações não governamentais</b></p> <p>3 Land O’ Lakes <b>Land O 'Lakes</b></p> <p>4 Other private companies <b>Outras empresas privadas</b></p> <p>5 Input suppliers <b>fornecedores de insumos</b></p> <p>6 Business development service providers <b>provedores de serviços de desenvolvimento de negócios</b></p>                                                                                                                                                                                                                  | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply<br/><b>Selecione tudo que se aplica</b></p> <p>*Ensure that if “99” is chosen, no other option is chosen<br/><b>Assegure-se que se “99” for escolhido, nenhuma outra</b></p>                                  |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                          |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------|
|           | 7 Own staff <b>Pessoal próprio</b><br>8 Other, specify <b>Outros, especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | <b>opção é escolhida</b> |
| Co_train3 | Thinking specifically about the training you've participated in from Land O'Lakes in the last 2 years, what were the training topics? what were your key learnings? Is there anything that you especially liked about this training? Are there any areas where you need more support? <b>Pensando especificamente no treinamento que você participou através da Land O'Lakes, nos últimos 2 anos, quais foram os tópicos destes treinamentos? Quais foram os aspectos chaves que aprendeu? Existe alguma coisa que você gostou especialmente deste treinamento? Existem assuntos onde você precisa de mais suporte?</b><br><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i> |  |                          |

## SECTION 1: RECORD KEEPING

**[Transition]: Enumerator: Thank you! Now we want to ask you about the records you keep for your business** *Inquiridor: Obrigado! Agora queremos perguntar sobre os registros que você mantém para o seu negócio*

| VARIABLE   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                        |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_record  | <p>Did your business keep any kinds of records or logs in the last 12 months (July 1, 2018 – June 30, 2019)? <i>Sua empresa fez algum tipo de registros nos últimos 12 meses (de 1 de julho de 2018 a 30 de junho de 2019)?</i></p> <p>1 Yes→co_record2 <i>sim</i><br/> 2 No <i>não</i><br/> -99 Do not know/refuse <i>Não sabe / se recusa a responder</i></p>                                                                                                           | _                                                                              | *Select only one option<br><i>selecione apenas uma opção</i>                                                                                                                                                                   |
| Co_record1 | <p>Why do you not keep any kinds of records or logs for your business? <i>Porquê não fez nenhum tipo de registo do seu negócio?</i><br/> <i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                                                                                         |                                                                                |                                                                                                                                                                                                                                |
| Co_record2 | <p>What types of records did you keep in the last 12 months (July 1, 2018 – June 30, 2019)? <i>Que tipos de registros você fez nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</i></p> <p>1 Income and expense ledger<br/><i>Registos de receita e despesas</i><br/> 2 Production ledgers (<i>tracks inputs vs outputs</i>) <i>Registos de produção (rastrea entradas e saídas)</i><br/> 3 Labor <i>trabalho</i><br/> 4 Equipment <i>equipamento</i></p> | _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ | *Select all that apply<br><i>Selecione tudo que se aplica</i><br>*Prompt with options<br>*Ensure if “-99” is chosen no other option is chosen<br><i>Assegure-se que se “99” for escolhido, nenhuma outra opção é escolhida</i> |



| VARIABLE   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | ENUMERATOR INSTRUCTIONS |
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|            | <p>5 Long range budgeting <b>orçamento de longo prazo</b></p> <p>6 rejections of incoming milk <b>rejeições de leite recebido</b></p> <p>7 Rejections of outgoing milk <b>rejeições dde leite vendido</b></p> <p>8 Monthly cash flow statement <b>relatório de fluxo de caixa</b></p> <p>9 Milk collection from suppliers <b>leite recolhido dos fornecedores</b></p> <p>10 Milk sales <b>vendas de leite</b></p> <p>Other, specify _____ <b>Outros, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p> |  |                         |
| Co_record3 | <p><b>*Ask if co_train1 = 6</b></p> <p>Did you start or change the way to keep records as a result of any training you received? If so, what training? How did it change? <b>Será que você começou ou mudou a forma de fazer registros como resultado de algum treinamento que recebeu? Se sim que treinamento? Como foi a mudança?</b></p> <p><b>*Please describe (open-ended) Por favor, descreva (em aberto)</b></p>                                                                                                                                  |  |                         |

| VARIABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                      |       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <p><b>[Transition]:</b> Enumerator: We want to really understand the revenues and costs of your cooperative to understand how your business is doing. In order to do this, we need to ask you specific questions about your costs and revenues over the last year. If you have a monthly cash flow statement from last year (July 1, 2018 – June 30, 2019), it would be helpful if you get out the copy of your monthly cash flow statement so that we can talk about exact values. If not, then please try to provide accurate values. <i>Inquiridor: Nós gostaríamos na verdade, de compreender os rendimentos e os custos (despesas) da vossa cooperativa, para entender o negócio que estão a fazer. Para tal, precisamos de fazer perguntas específicas acerca dos vossos custos e das receitas ao longo do último ano. Se tivessem relatórios mensais de fluxo de caixa do ano último ano (1 de Julho de 2018 a 30 de Junho 2019) seria muito útil e se pudéssemos ter uma cópia, poderíamos falar de valores exatos. Se não, então por favor tente fornecer valores acurados.</i></p> |                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Co_cash2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>Is it possible to provide a copy of the monthly cash flow statement from last year (July 1, 2018 – June 30, 2019)? <i>É possível ter cópias dos relatórios de fluxo de caixa mensais do último ano (1 de Julho de 2018 a 30 de Junho de 2019)?</i></p> <p>1 Yes <i>sim</i><br/> 2 No <i>Não</i><br/> -99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i></p> | _     | <p>*Ask if co_record2 = 8<br/> *Select only one option<br/> <i>selecione apenas uma opção</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Co_othercost_record1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>Does the cash flow statement have information on cost of utilities? <i>O relatório de fluxo de caixa tem informação dos custos dos serviços públicos</i></p> <p>1 Yes <i>sim</i><br/> 2 No<br/> -99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i></p>                                                                                                      | _     | <p>*Ask if co_record2 = 8<br/> *Select only one option<br/> <i>selecione apenas uma opção</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Co_othercost1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>What was the average monthly cost of utilities for your business over the last 12 months (July 1, 2018 – June 30, 2019)? <i>Qual foi o custo médio mensal de serviços públicos para o seu negócio nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</i></p>                                                                                                        | _____ | <p>*If co_othercost_record1 = 1 then fill from record book, else ask respondent and fill out<br/> <i>Se tiver livro de registos, preencha na base desse, se não pergunte ao entrevistado</i><br/> *Ensure average monthly price in last 12 months is quoted <i>Garantir que o preço médio mensal nos últimos 12 meses seja registado</i><br/> *Explain that utilities include costs for fuel, electricity and water <i>Explique que os serviços públicos incluem custos de combustível, eletricidade e água</i></p> |

| VARIABLE             |                                                                                                                                                                                                                                                                                                                                              |       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|                      |                                                                                                                                                                                                                                                                                                                                              |       | <p>*Enter -99 if don't know/refuse Digite -99 se não sabe /se recusa</p> <p>*Enter 0 if this expense was not incurred Insira 0 se estas despesas não foram feitas</p> <p>*Enter in Metical Insira em meticais</p>                                                                                                                                                                                                                                                                                                           |
| Co_othercost_record2 | <p>Does the cash flow statement have information on rental costs of land/buildings/machinery? O relatório de fluxo de caixa tem informações do custo do aluguer de terrenos/ edifícios/ maquinaria?</p> <p>1 Yes sim</p> <p>2 No não</p> <p>-99 Do not know/refuse to answer Não sabe / se recusa a responder</p>                            | I__I  | <p>*Ask if co_record2 = 8</p> <p>*Select only one option selecione apenas uma opção</p>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Co_othercost2        | <p>What was the total rental cost of lands and buildings in the last 12 months (July 1, 2018 – June 30, 2019)? Qual foi o custo total de aluguer de terrenos e edifícios nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</p>                                                                                                | _____ | <p>*If co_othercost_record2 = 1 then fill from record book, else ask respondent and fill out</p> <p>Se tiver livro de registos, preencha na base desse, se não pergunte ao entrevistado</p> <p>*Ensure total cost in last 12 months is quoted Garantir que o custo total nos últimos 12 meses seja cotado</p> <p>*Enter -99 if don't know/refuse Digite -99 se não sabe /se- recusa</p> <p>*Enter 0 if this expense was not incurred Insira 0 se esta despesa não foi feita</p> <p>*Enter in Metical Insira em meticais</p> |
| Co_othercost3        | <p>What was the total rental cost of machinery, vehicles and equipment (including storage equipment) in the last 12 months (July 1, 2018 – June 30, 2019)? Qual foi o custo total de alugar máquinas, veículos e equipamentos (incluindo equipamentos de armazenamento) nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</p> | _____ | <p>*If co_othercost_record2 = 1 then fill from record book, else ask respondent and fill out</p> <p>Se tiver livro de registos, preencha na base desse, se não pergunte ao entrevistado</p> <p>*Ensure total cost in last 12 months is quoted Garantir que o custo total nos últimos 12 meses seja cotado</p>                                                                                                                                                                                                               |

| VARIABLE             |                                                                                                                                                                                                                                                                                            |       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|                      |                                                                                                                                                                                                                                                                                            |       | <p>*Enter -99 if don't know/refuse Digite -99 se não sabe /se- recusa</p> <p>*Enter 0 if this expense was not incurred Insira 0 se esta despesa não foi feita</p> <p>*Enter in Metical Insira em meticais*Explain: this could include milk testing equipment Explique que estes podem incluir equipamento de testagem de leite</p>                                                                                                                                                                                           |
| Co_othercost_record3 | <p>Does the cash flow statement have information on maintenance and repair costs? O relatório do fluxo de caixa tem informação sobre os custos de manutenção e reparação?</p> <p>1 Yes sim</p> <p>2 No não</p> <p>-99 Do not know/refuse to answer Não sabe / se recusa a responder</p>    | I__I  | <p>*Ask if co_record2 = 8</p> <p>*Select only one option selecione apenas uma opção</p>                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Co_othercost4        | <p>What was the total cost of maintenance and repair in the last 12 months (July 1, 2018 – June 30, 2019)? Qual foi o custo total de manutenção e reparação nos últimos 12 meses (1 de julho de 2018 - 30 de junho, 2019)?</p>                                                             | _____ | <p>*If co_othercost_record3 = 1 then fill from record book, else ask respondent and fill out</p> <p>Se tiver livro de registros, preencha na base desse, se não pergunte ao entrevistado</p> <p>*Ensure total cost in last 12 months is quoted Garantir que o custo total nos últimos 12 meses seja cotado</p> <p>*Enter -99 if don't know/refuse Digite -99 se não sabe /se- recusa</p> <p>*Enter 0 if this expense was not incurred Insira 0 se esta despesa não foi feita</p> <p>*Enter in Metical Insira em meticais</p> |
| Co_othercost_record4 | <p>Does the cash flow statement have information on cost of consumables, including milk utensils, office consumables and other consumables? O relatório do fluxo de caixa tem informação do custo de consumíveis, incluindo utensílios para leite, consumíveis de escritório e outros?</p> | I__I  | <p>*Ask if co_record2 = 8</p> <p>*Select only one option selecione apenas uma opção</p>                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| VARIABLE                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                | 1 Yes <b>Sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Co_othercost5                                                                                                                                                                                                                                                                                  | What was the total cost of consumables including milk utensils, milk quality testing consumables, office consumables, any consumables you provide to your members and other consumables, in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Qual foi o custo total de consumíveis, incluindo utensílios de leite, consumíveis para os testes de qualidade do leite, outros consumíveis que fornecem aos membros e outros consumíveis diversos, nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b> | _____ | <b>*If co_othercost_record4 = 1 then fill from record book, else ask respondent and fill out</b><br><b>Se tiver livro de registros, preencha na base desse, se não pergunte ao entrevistado</b><br><b>*Ensure total cost in last 12 months is quoted <b>Garantir que o custo total nos últimos 12 meses seja cotado</b></b><br><b>*Enter -99 if don't know/refuse <b>Digite -99 se não sabe /se- recusa</b></b><br><b>*Enter 0 if this expense was not incurred <b>Insira 0 se esta despesa não foi feita</b></b><br><b>*Enter in Metical <b>Insira em meticais</b></b><br><b>*Explain: this could include costs for milk utensils <b>Explique que deve incluir os custos dos utensílios de leiter</b></b> |
| Co_othercost_record6                                                                                                                                                                                                                                                                           | Does the cash flow statement have information on your business transportation costs (i.e. fuel, taxis, etc.)? <b>O relatório do fluxo de caixa tem informação sobre o custo de transporte no seu negócio?</b><br>1 Yes <b>sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                          | I__I  | <b>*Ask if co_record2 = 8</b><br><b>*Select only one option <b>selecione apenas uma opção</b></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>[Enumerator Instruction] : If co_othercost_record6 = 1, then for questions co_othercost7 – co_othercost8, fill from the record book ; else ask respondent and then fill out <b>preencher dos livros de registo, se não tiver pergunte ao entrevistado as informações para preencher</b></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Co_othercost7                                                                                                                                                                                                                                                                                  | What is the average monthly cost of transportation for your business in the last rainy season (November 2018 through April 2019)? <b>Qual é o custo médio mensal de transporte no seu negócio na última época</b>                                                                                                                                                                                                                                                                                                         | _____ | <b>*Enter in Metical <b>Insira em meticais</b></b><br><b>*Enter -99 if do not know/refuse to answer and "0" if no costs incurred <b>Digite -99 se não sabe /se recusa e</b></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| VARIABLE        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   | ENUMERATOR INSTRUCTIONS                                                                                                                |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------|
|                 | chuvosa (Novembro de 2018 a Abril de 2019)?                                                                                                                                                                                                                                                                                                                                                                                                                                 |   | Insira 0 se esta despesa não foi feita                                                                                                 |
| Co_othercost8   | What is the average monthly cost of transportation for your business in the last dry season (May through October 2018)?<br>Qual é o custo médio mensal de transporte no seu negócio na última época seca (Maio a Outubro de 2018)?                                                                                                                                                                                                                                          | — | *Enter in Metical <i>Insira em meticais</i><br><br>*Enter -99 if do not know/refuse to answer <i>Digite -99 se não sabe /se recusa</i> |
| Co_othercost9_1 | Other than staff costs and milk purchase costs, that we will touch on later, what other costs of production in the last 12 months have we not included in the previous questions? <i>Sem contar com os custos do pessoal e da compra do leite, que serão abordados mais tarde, quais foram os outros custos de produção nos últimos 12 meses, que não foram incluídos nas perguntas anteriores?</i><br><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i> |   |                                                                                                                                        |
| Co_othercost9_2 | Does the cash flow statement have information on these other costs? <i>O relatório do fluxo de caixa tem informação desses custos?</i><br>1 Yes <i>sim</i><br>2 No <i>não</i><br>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i>                                                                                                                                                                                                                   | _ | <i>*Ask if co_record2 = 8</i><br><i>*Select only one option</i><br><i>selecione apenas uma opção</i>                                   |

| VARIABLE        |                                                                                                                                                                                                                                                                                |       | ENUMERATOR INSTRUCTIONS                                                                                                                       |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Co_othercost9_3 | <p><i>*Ask if co_othercost9_2 = 1</i></p> <p>Which other costs does the cash flow have information about? <i>Que outros custos o relatório do fluxo de caixa tem?</i></p> <p><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                          |       |                                                                                                                                               |
| Co_othercost9_4 | <p>What were the other total costs of production that we have not included in the last 12 months (July 1, 2018 – June 30, 2018)? <i>Quais foram os outros custos totais de produção que não incluímos nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</i></p> | _____ | <p><i>*Enter in Metical Insira em meticais</i></p> <p><i>*Enter -99 if do not know/refuse to answer Digite -99 se não sabe /se recusa</i></p> |

## **SECTION 2: PROCUREMENT AND SALES**

**[Transition]** Enumerator: Thank you! Now we want to talk to you about your procurement and sales of milk. *Inquiridor: Obrigado! Agora gostaríamos de falar acerca das suas compras e vendas de leite*

| VARIABLE     |                                                                                                                                                                                                                                                                                                                                                                          |      | ENUMERATOR INSTRUCTIONS                                          |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------|
| Co_procure_0 | <p>Did you collect milk from suppliers in the past 12 months between July 31, 2018 to June 30, 2019? <i>Recolheram leite de fornecedores nos últimos 12 meses, entre 1 de Julho de 2018 e 30 de Junho de 2019?</i></p> <p>1 Yes→co_procure_record1 <i>sim</i></p> <p>2 No <i>não</i></p> <p>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i></p> | I__I | <p><i>*Select only one option selecione apenas uma opção</i></p> |

| VARIABLE                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                 |       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_procure_0_1                                                                                                                                                                                                                                                                                                                                                                      | Why did you not collect milk from suppliers in the past 12 months between July 31, 2018 to June 30, 2019? <i>Porque razão não recolheram leite de fornecedores nos últimos 12 meses, entre 1 de Julho de 2018 e 1 de Junho de 2019?</i><br><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i> |       |                                                                                                                                                                                              |
|  Terminate the survey if respondent did not collect any milk from milk suppliers in the last 12 months and move to next respondent on the list <i>Termine o inquérito se o entrevistado não recolheu leite de fornecedores nos últimos 12 meses e passe para o próximo entrevistado da lista</i> |                                                                                                                                                                                                                                                                                                                 |       |                                                                                                                                                                                              |
| <i>[Transition]</i> Enumerator: Let's first talk about your procurement of milk <i>Inquiridor: vamos falar primeiro das suas compras de leite</i>                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                 |       |                                                                                                                                                                                              |
| Co_procure_record1                                                                                                                                                                                                                                                                                                                                                                  | Does the record book have information on milk procurement? <i>O vosso livro de registos, tem informação sobre as compras de leite?</i><br>1 Yes <i>sim</i><br>2 No <i>não</i><br>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i>                                                       | I__I  | <i>*Select only one option<br/>selecione apenas uma opção</i><br><i>*Ask if co_record2 = 9</i>                                                                                               |
| Co_procure_1                                                                                                                                                                                                                                                                                                                                                                        | How many suppliers regularly supplied the business during the dry season (May through October 2018)? <i>Quantos fornecedores fazem fornecimentos regulares durante a época seca (Maio a Outubro 2018)?</i>                                                                                                      | _____ | <i>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out</i><br><i>Se tiver livro de registos, preencha na base desse, se não pergunte ao entrevistado</i> |



| VARIABLE     |                                                                                                                                                                                                                                     |       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                  |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                                                                                                                                                                                                                     |       | *Enter -99 if do not know/refuse to answer Digite - 99 se não sabe /se recusa                                                                                                                                                                                                                            |
| Co_procure_2 | How many suppliers regularly supplied the business during the rainy season (November 2018 through April 2019)?<br>Quantos fornecedores fazem fornecimentos regulares durante a época chuvosa (Novembro 2018 a Abril 2019)?          | _____ | *Enter -99 if do not know/refuse to answer Digite - 99 se não sabe /se recusa<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha do livro de registos e se não tiver, preencha com as respostas do entrevistado                                         |
| Co_procure_3 | What volume of milk did the business procured from suppliers in the last dry season (May through October 2018)? Qual foi o volume de leite que o seu negócio comprou de fornecedores na última época seca (Maio a Outubro de 2018)? | _____ | *Enter in liters Insira em litros<br>*Enter -99 if do not know/refuse to answer Digite - 99 se não sabe /se recusa<br>*If co_procure_record1 = 1 then fill from record book, else ask the respondent and fill out                                                                                        |
| Co_procure_4 | What was the average price paid to suppliers per liter of milk, in the last dry season (May through October 2018)? Qual foi preço médio pago aos fornecedores por litro de leite, na última época seca (Maio a Outubro de 2018)?    | _____ | *Enter in Metical Insira em meticais<br>*Enter -99 if do not know/refuse to answer Digite - 99 se não sabe /se recusa<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha do livro de registos e se não tiver, preencha com as respostas do entrevistado |
| Co_procure_5 | What is the total value of milk procured from suppliers, in the last dry season (May through October 2018)? Qual foi o valor total do leite comprador aos fornecedores, na última época seca (Maio a Outubro de 2018)?              | _____ | *Enter in Metical Insira em meticais<br>*Enter -99 if do not know/refuse to answer Digite - 99 se não sabe /se recusa<br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha do livro de registos e se não tiver, preencha com as respostas do entrevistado |

| VARIABLE     |                                                                                                                                                                                                                                                          |       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                    |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                                                                                                                                                                                                                                          |       | *Check to ensure the total value is the product of co_procure_3 and co_procure_4                                                                                                                                                                                                                                           |
| Co_procure_6 | What volume of milk has the business procured from suppliers in the last rainy season (November 2018 through April 2019), Qual foi o volume de leite que o seu negócio comprou de fornecedores, na última época chuvosa (Novembro 2018 a Abril de 2019)? | _____ | *Enter in liters <b>Insira em litros</b><br>*Enter -99 if do not know/refuse to answer <b>Digite - 99 se não sabe /se recusa</b><br><br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha do livro de registos e se não tiver, preencha com as respostas do entrevistado    |
| Co_procure_7 | What was the average price paid to suppliers per liter of milk in the rainy season (November 2018 through April 2019)? Qual foi o preço médio pago aos fornecedores por litro de leite na última época chuvosa (Novembro 2018 a Abril de 2019)?          | _____ | *Enter in Metical <b>Insira em meticais</b><br>*Enter -99 if do not know/refuse to answer <b>Digite - 99 se não sabe /se recusa</b><br><br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha do livro de registos e se não tiver, preencha com as respostas do entrevistado |
| Co_procure_8 | What is the total value of milk procured from suppliers, in the last rainy season (November 2018 through April 2019)? Qual foi o valor total do leite comprado aos fornecedores na última época chuvosa (Novembro de 2018 a Abril de 2019)?              | _____ | *Enter in Metical <b>Insira em meticais</b><br>*Enter -99 if do not know/refuse to answer <b>Digite - 99 se não sabe /se recusa</b><br><br>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Check to ensure the total value is the product of co_procure_6 and co_procure_7     |
| Co_procure_9 | Does the business have any formal agreement with any of your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)? A empresa tem algum contrato formal com qualquer um dos seus fornecedores de leite nos últimos 12 meses                | I__I  | *Select only one option <b>selecione apenas uma opção</b>                                                                                                                                                                                                                                                                  |

| VARIABLE         |                                                                                                                                                                                                                                                                                                                                                                                                                                 |       | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                            |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <p>(1 de julho de 2018 a 30 de junho de 2019)?</p> <p>1 Yes <b>sim</b></p> <p>2 No→ co_procure_9_2 <b>não</b></p> <p>-99 Do not know/refuse to answer→ co_procure_9_2 <b>Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                    |
| Co_procure_9_1   | <p>How many agreements did you have with your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantos contratos teve com os seus fornecedores de leite nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p>                                                                                                                                                                         | _____ | <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p> <p>*If co_procure_record1 = 1 then fill from record book, else ask respondent and fill out</p>                                                                          |
| Co_procure_9_1_1 | <p>Can you describe these agreements? <b>Pode descrever esses contratos?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                    |
| Co_procure_9_2   | <p>Did you provide any support services to your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Prestou algum serviço de apoio aos seus fornecedores de leite nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p> <p>1 Yes <b>sim</b></p> <p>2 No→ co_procure_9_2b <b>não</b></p> <p>-99 Do not know/refuse to answer→ co_procure_9_2b <b>Não sabe / se recusa a responder</b></p> | I__I  | <p>*Select only one option <b>selecione apenas uma opção</b></p> <p>*Explain: Services could include training, technical support, transport services etc. <b>Explique que Serviços podem incluir treinamento, suporte técnico, serviços de transporte, etc</b></p> |

| VARIABLE        |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                              | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                            |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_procure_9_2a | <p>Can you explain the types of support services you offered? <b>Pode explicar os tipos de serviços de suporte oferecidos?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                                   |                                                                                                              |                                                                                                                                                                                                                                    |
| Co_procure_9_2b | <p>Why do you not provide support services to your suppliers? <b>Porque razão não presta serviços de apoio aos seus fornecedores?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                            |                                                                                                              |                                                                                                                                                                                                                                    |
| Co_procure_10   | <p>How is the milk transported from your suppliers? <b>Como o leite dos seus fornecedores é transportado?</b></p> <ol style="list-style-type: none"> <li>1 Suppliers come to our doorstep <b>fornecedores vêm à nossa porta</b></li> <li>2 Business travels to buy milk from seller <b>A empresa faz viagens para comprar leite do fornecedor</b></li> <li>3 Other, specify <b>Outro, especifique</b></li> </ol> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p><b>*Select all that apply Selecione tudo que se aplica</b></p> <p><b>*Ensure that if -99 is chosen , no other option is chosen</b></p> <p><b>Assegure-se que se 99 foi escolhido, nenhuma outra opção pode ser incluída</b></p> |

| VARIABLE      |                                                                                                                                                                                                                                   |  | ENUMERATOR INSTRUCTIONS |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------|
|               | -99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i>                                                                                                                                                          |  |                         |
| Co_procure_11 | What challenges, if any, does the business face in procurement of milk? <i>Quais os desafios, se houver, o vosso negócio enfrenta na compra do leite?</i><br><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i> |  |                         |

| VARIABLE      | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_procure_12 | <p>How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address any milk procurement challenges? Como é que o vosso negócio tentou resolver esses desafios? O que funcionou e o que não resultou? O projeto MERCADO ajudou de alguma forma a resolver os desafios de aquisição do leite?</p> <p><i>*If no challenges, skip question Se não houver desafios, deixe esta questão</i></p> <p><i>*Please describe (open-ended) Por favor, descreva (abertamente)</i></p> |

| VARIABLE      |                                                                                                                                                                                                                                                                                                                                                                                                        |   | ENUMERATOR INSTRUCTIONS                              |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------|
| Co_procure_13 | <p>What does the business think will be necessary to successfully tackle challenges in milk procurement? ? O que é que a empresa julga que será necessário para enfrentar com sucesso esses desafios da compra do leite?</p> <p><i>*If no challenges, skip question</i></p> <p><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                |   |                                                      |
| Co_procure_14 | <p>Have you seen any changes in milk procurement since your participation in the MERCADO project, if at all? Tem visto alguma mudança na compra de leite desde a sua participação no projecto MERCADO?</p> <p>1 Increased Aumentou</p> <p>2 Decreased Diminuiu</p> <p>3 Stayed the same Ficou na mesma</p> <p>-99 Do not know/refuse to answer→<br/>co_procure_16 Não sabe / se recusa a responder</p> | _ | <p>*Select one option selecione apenas uma opção</p> |

| VARIABLE      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       | ENUMERATOR INSTRUCTIONS                                                              |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------|
| Co_procure_15 | <p>How do you think milk procurement changed because of the MERCADO project?<br/> <i>Como julga que a compra de leite mudou devido ao projecto MERCADO?</i><br/> <i>*Please describe (open ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                                                            |       |                                                                                      |
| Co_procure_16 | <p>How was the volume of milk procured from suppliers been impacted by Cyclone Idai, if at all? <i>Como foi que o volume de leite adquirido dos fornecedores foi afetado pelo ciclone Idai?</i></p> <p>1 Increased→ co_procure_18<br/> <i>aumentou</i></p> <p>2 Decreased <i>diminuiu</i></p> <p>3 Stayed the same→ co_procure_18<br/> <i>ficou na mesma</i></p> <p>-99 Do not know/refuse to answer→<br/> co_procure_18 <i>Não sabe / se recusa a responder</i></p> | I__I  | *Select one option <i>selecione apenas uma opção</i>                                 |
| Co_procure_17 | <p>How many liters per month did your procurement decrease as a result of Cyclone Idai? <i>Quantos litros de leite diminuiriam por mês, nas suas compras devido ao ciclone Idai?</i></p>                                                                                                                                                                                                                                                                             | _____ | *Enter -99 if do not know/refuse to answer <i>Digite - 99 se não sabe /se recusa</i> |
| Co_procure_18 | <p>How was the price paid to suppliers impacted by Cyclone Idai, if at all? <i>Como alterou o preço do leite pago aos fornecedores devido ao cyclone Idai?</i></p> <p>1 Increased→ co_procure_20<br/> <i>aumentou</i></p> <p>2 Decreased <i>diminuiu</i></p> <p>3 Stayed the same→ co_procure_21<br/> <i>ficou na mesma</i></p> <p>-99 Do not know/refuse to answer→<br/> co_procure_21 <i>Não sabe / se recusa a responder</i></p>                                  | I__I  | *Select one option <i>selecione apenas uma opção</i>                                 |



| VARIABLE                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                               |                                      | ENUMERATOR INSTRUCTIONS                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_procure_19                                                                                                                                                                                                                                | How many meticals/liter did the price paid to suppliers decrease as a result of Cyclone Idai? <b>Quantos meticais por litro baixou no preço pago ao fornecedores, devido ao cyclone Idai?</b>                                                                                                                                                                                 | _____                                | *Enter -99 if do not know/refuse to answer <b>Digite - 99 se não sabe /se recusa</b>                                                               |
| Co_procure_20                                                                                                                                                                                                                                | How many meticals/liter did the price paid to suppliers increase as a result of Cyclone Idai? <b>Quantos meticais por litro aumentou no preço pago ao fornecedores, devido ao cyclone Idai?</b>                                                                                                                                                                               | _____                                | *Enter -99 if do not know/refuse to answer <b>Digite - 99 se não sabe /se recusa</b>                                                               |
| Co_procure_21                                                                                                                                                                                                                                | Have you faced other challenges in procurement of milk as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term? <b>Que outros desafios enfrentou na aquisição de leite como resultado do Cyclone Idai? Acha que os efeitos que acabou de mencionar são de curto ou longo-prazo?</b><br><i>*Please describe (open-ended)</i> |                                      |                                                                                                                                                    |
| <b>[Transition]:</b> Enumerator: Great! Now, let's talk specifically about sales of raw milk. Please only think about raw milk <b>Inquiridor: Ótimo! Vamos então falar sobre as vendas de leite cru. Por favor pense acerca de leite cru</b> |                                                                                                                                                                                                                                                                                                                                                                               |                                      |                                                                                                                                                    |
| Co_sales_record1                                                                                                                                                                                                                             | Does the record book have information on raw milk sales? <b>O livro de registos tem informações sobre a venda de leite cru?</b><br>1 Yes <b>sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                            | I__I                                 | *Select only one option <b>selecione apenas uma opção</b><br>*Ask if co_record2 = 10                                                               |
| co_sales_2_1                                                                                                                                                                                                                                 | Who did you sell your raw milk to in the last dry season (May through October 2018)? <b>Para quem vendeu o seu leite cru na última época seca (Maio a Outubro de 2018)?</b><br>1 Processors <b>Processador</b>                                                                                                                                                                | I__I<br>I__I<br>I__I<br>I__I<br>I__I | *Select all that appy <b>Selecione tudo que se aplica</b><br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out |

| VARIABLE          |                                                                                                                                                                                                                                                                                                                                                                              |                                                                 |                                                               | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                 |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | 2 Retailers→ co_sales_3_1<br><b>Retalhistas</b><br>3 Direct sales to consumers→<br>co_sales_3_1 <b>directo a</b><br><b>consumidores</b><br>4 Other businesss→ co_sales_3_1<br><b>outros negócios</b><br>5 Other, specify→ co_sales_3_1<br><b>Outros, especifique</b><br>-99 Do not know/refuse to answer →<br>co_sales_3_1 <b>Não sabe / se recusa a</b><br><b>responder</b> |                                                                 |                                                               | <b>Preencha do livro de registos e se não tiver, preencha com as respostas do entrevistado</b>                                                                                                                                                          |
| Co_sales_2_1_name | Please specify name (s): <b>Por favor especifique o (s) nome (s)</b>                                                                                                                                                                                                                                                                                                         |                                                                 |                                                               | *Please fill <b>Por favor preencha</b>                                                                                                                                                                                                                  |
| Co_sales_3_1      | In the last dry season (May through October 2018), who has the business sold raw milk to, what was the volume sold, and what price did they pay? <b>Na última época seca (Maio a Outubro de 2018), a quem a empresa vendeu leite cru? Qual foi o volume vendido? A que preço foi pago?</b>                                                                                   |                                                                 |                                                               | *If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br><b>Preencha do livro de registos e se não tiver, preencha com as respostas do entrevistado</b><br>*Enter “0” if no sales <b>Insira “0” se não houve vendas</b> |
|                   | Buyer Type<br><b>Tipo de comprador</b>                                                                                                                                                                                                                                                                                                                                       | Quantity Sold (in liters)<br><b>Quantidade vendida (litros)</b> | Price/liter (in Metical)<br><b>Preços/litro (em meticais)</b> |                                                                                                                                                                                                                                                         |
|                   | Processors<br><b>Processador</b>                                                                                                                                                                                                                                                                                                                                             |                                                                 |                                                               |                                                                                                                                                                                                                                                         |
|                   | Retailers<br><b>Retalhista</b>                                                                                                                                                                                                                                                                                                                                               |                                                                 |                                                               |                                                                                                                                                                                                                                                         |
|                   | Direct sales to consumers<br><b>Venda directa ao consumidor</b>                                                                                                                                                                                                                                                                                                              |                                                                 |                                                               |                                                                                                                                                                                                                                                         |
|                   | Other businesses<br><b>Outros negócios</b>                                                                                                                                                                                                                                                                                                                                   |                                                                 |                                                               |                                                                                                                                                                                                                                                         |
|                   | Other, specify                                                                                                                                                                                                                                                                                                                                                               |                                                                 |                                                               |                                                                                                                                                                                                                                                         |

| VARIABLE     |                                                                                                                                                                                                                                                 |  |  | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                  |  |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|              | Outros, especifique                                                                                                                                                                                                                             |  |  |                                                                                                                                                                                                                                                                                          |  |
| Co_sales_6_1 | What was the business's total volume of raw milk sales in the last dry season (May through October 2018)? Qual foi o volume total das vendas de leite cru, na última época seca (Maio a Outubro de 2018)?                                       |  |  | *Enter in liters Insira em litros<br>*Enter 0 if no sales Insira "0" se não houve vendas<br><br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>Preencha do livro de registros e se não tiver, preencha com as respostas do entrevistado        |  |
| Co_sales_7_1 | What is the average price received from buyers per liter of raw milk in the last dry season (May through October 2018)? Qual foi o preço médio que os compradores pagaram por litro de leite cru na última época seca (Maio a Outubro de 2018)? |  |  | *Enter in price/liter of milk sold to processors Insira o preço/litro vendido ao processador<br>*Enter in Metical Insira em meticais<br>*Enter 0 if no sales Insira "0" se não houve vendas<br><br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out |  |
| Co_sales_5_1 | What was the business's total value of raw milk sales in the last dry season (May through October 2018)? Qual foi o valor total das vendas do leite cru na última época seca (de maio a outubro de 2018)?                                       |  |  | *Enter in Metical Insira em meticais<br>*Enter -99 if do not know/refuse to answer Digite -99 se não sabe /se recusa<br>*Enter 0 if no sales Insira "0" se não houve vendas<br><br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out                 |  |
| Co_sales_5_1 | What was the business's total value of raw milk sales in the last dry season (May through October 2018)? Repetido                                                                                                                               |  |  | *Enter in Metical Insira em meticais<br>*Enter -99 if do not know/refuse to answer Digite -99 se não sabe /se recusa<br>*Enter 0 if no sales Insira "0" se não houve vendas<br><br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out                 |  |

| VARIABLE                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                               | ENUMERATOR INSTRUCTIONS                                          |                                                                 |                                                               |                                  |  |  |                                |  |  |                                                                 |  |  |                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|----------------------------------|--|--|--------------------------------|--|--|-----------------------------------------------------------------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| co_sales_2_2                                                    | <p>Who did you sell your raw milk to in the last rainy season (November 2018 through April 2019)? <b>Para quem vendeu o seu leite cru na última época chuvosa (Novembro de 2018 a Abril de 2019)?</b></p> <div><div><div>1 Processors <b>Processador</b></div><div>2 Retailers→ co_sales_3_2 <b>Retalhistas</b></div><div>3 Direct sales to consumers→ co_sales_3_2 <b>directo a consumidores</b></div><div>4 Other businesses→ co_sales_3_2 <b>outros negócios</b></div><div>5 Other, specify→ co_sales_3_2 <b>Outros, especifique</b></div><div>-99 Do not know/refuse to answer → co_sales_3_2 <b>Não sabe / se recusa a responder</b></div></div><div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div></div></div> |                                                               | <p>*Select all that appy <b>Selecione tudo que se aplica</b></p> |                                                                 |                                                               |                                  |  |  |                                |  |  |                                                                 |  |  |                                                                                                                                                                                                                                                                 |
| Co_sales_2_2_name                                               | <p>Please specify name: <b>Por favor especifique o (s) nome (s)</b></p> <div><div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                               | <p>*Please fill <b>Por favor preencha</b></p>                    |                                                                 |                                                               |                                  |  |  |                                |  |  |                                                                 |  |  |                                                                                                                                                                                                                                                                 |
| Co_sales_3_2                                                    | <p>In the last rainy season (November 2018 through April 2019), who has the business sold raw milk to, what was the volume sold, and what price did they pay? <b>Na última época chuvosa (Novembro de 2018 a Abril de 2019), a quem a empresa vendeu leite cru? Qual foi o volume vendido? A que preço foi pago?</b></p> <table><tr><th>Buyer Type<br/><b>Tipo de comprador</b></th><th>Quantity Sold (in liters)<br/><b>Quantidade vendida (litros)</b></th><th>Price/liter (in Metical)<br/><b>Preços/litro (em meticais)</b></th></tr><tr><td>Processors<br/><b>Processador</b></td><td></td><td></td></tr><tr><td>Retailers<br/><b>Retalhista</b></td><td></td><td></td></tr><tr><td>Direct sales to consumers<br/><b>Venda directa ao consumidor</b></td><td></td><td></td></tr></table>                                                                                            |                                                               | Buyer Type<br><b>Tipo de comprador</b>                           | Quantity Sold (in liters)<br><b>Quantidade vendida (litros)</b> | Price/liter (in Metical)<br><b>Preços/litro (em meticais)</b> | Processors<br><b>Processador</b> |  |  | Retailers<br><b>Retalhista</b> |  |  | Direct sales to consumers<br><b>Venda directa ao consumidor</b> |  |  | <p>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out <b>Preencha do livro de registos e se não tiver, preencha com as respostas do entrevistado</b></p> <p>*Enter “0” if no sales <b>Insira “0” se não houve vendas</b></p> |
| Buyer Type<br><b>Tipo de comprador</b>                          | Quantity Sold (in liters)<br><b>Quantidade vendida (litros)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Price/liter (in Metical)<br><b>Preços/litro (em meticais)</b> |                                                                  |                                                                 |                                                               |                                  |  |  |                                |  |  |                                                                 |  |  |                                                                                                                                                                                                                                                                 |
| Processors<br><b>Processador</b>                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                               |                                                                  |                                                                 |                                                               |                                  |  |  |                                |  |  |                                                                 |  |  |                                                                                                                                                                                                                                                                 |
| Retailers<br><b>Retalhista</b>                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                               |                                                                  |                                                                 |                                                               |                                  |  |  |                                |  |  |                                                                 |  |  |                                                                                                                                                                                                                                                                 |
| Direct sales to consumers<br><b>Venda directa ao consumidor</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                               |                                                                  |                                                                 |                                                               |                                  |  |  |                                |  |  |                                                                 |  |  |                                                                                                                                                                                                                                                                 |

| VARIABLE     |                                                                                                                                                                                                                                                                           |  |      | ENUMERATOR INSTRUCTIONS |                                                                                                                                                                                                                                                                                          |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | Other businesses<br>Outros negócios                                                                                                                                                                                                                                       |  |      |                         |                                                                                                                                                                                                                                                                                          |
|              | Other, specify<br>Outros, especifique                                                                                                                                                                                                                                     |  |      |                         |                                                                                                                                                                                                                                                                                          |
| Co_sales_6_2 | What was the business's total volume of raw milk sales in the last rainy season (November 2018 through April 2019)? Qual foi o volume total das vendas de leite cru, na última época chuvosa (Novembro de 2018 a Abril de 2019)?                                          |  |      |                         | *Enter in liters Insira em litros<br>*Enter 0 if no sales Insira "0" se não houve vendas<br><br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>Preencha do livro de registros e se não tiver, preencha com as respostas do entrevistado        |
| Co_sales_7_2 | What is the average price received from buyers per liter of raw milk in the last rainy season (November 2018 through April 2019)? Qual foi o preço médio que os compradores pagaram por litro de leite cru na última época das chuvas (Novembro de 2018 a Abril de 2019)? |  |      |                         | *Enter in price/liter of milk sold to processors Insira o preço/litro vendido ao processador<br>*Enter in Metical Insira em meticais<br>*Enter 0 if no sales Insira "0" se não houve vendas<br><br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out |
| Co_sales_5_2 | What was the business's total value of raw milk sales in the last rainy season (November 2018 through April 2019)? Qual foi o valor total das vendas do leite cru na última época chuvosa (Novembro de 2018 a Abril de 2019)?                                             |  |      |                         | *Enter in Metical Insira em meticais<br>*Enter -99 if do not know/refuse to answer Digite - 99 se não sabe /se recusa<br>*Enter 0 if no sales Insira "0" se não houve vendas<br><br>*If co_sales_record1 = 1 then fill from record book, else ask respondent and fill out                |
| Co_sales_14  | Does the business have any agreement with a buyer in the last 12 months (July 1, 2018 – June 30, 2019)? A empresa/cooperativa teve algum contrato com                                                                                                                     |  | I__I |                         | *Select only one option<br>selecione apenas uma opção                                                                                                                                                                                                                                    |

| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                 | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <p>compradores nos últimos 12 meses (1º de julho de 2018 a 30 de junho de 2019)?</p> <p>1 Yes <b>sim</b></p> <p>2 No→ co_sales_17 <b>não</b></p> <p>-99 Do not know/refuse to answer→ co_sales_17 <b>Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                         |                                                                                                                                 |                                                                                                                                                                                                                   |
| Co_sales_15 | <p>How many agreements did you have with buyers in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantos contratos teve com compradores nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p>                                                                                                                                                                                                                                                              | _____                                                                                                                           | <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p>                                                                                                                        |
| Co_sales_16 | <p>Can you describe these agreements? ? <b>Pode descrever esses acordos?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva (abertamente)</i></p>                                                                                                                                                                                                                                                                                                                        |                                                                                                                                 |                                                                                                                                                                                                                   |
| Co_sales_17 | <p>How is the milk transported to your buyers? <b>Como o leite é transportado para os seus compradores?</b></p> <p>1 Buyer (processor etc.) comes to our doorstep <b>O comprador (processador etc) vem à sua porta</b></p> <p>2 Business travels to sell milk to buyer <b>A empresa/cooperativa desloca-se para vender o leite ao comprador</b></p> <p>3 Other, specify <b>Outro, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p> | <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> | <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> <p>*Ensure that if “-99” is chosen, no other option is chosen <b>Assegure-se que se “99” for escolhido, nenhuma outra opção é escolhida</b></p> |

| VARIABLE    | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_sales_18 | <p>What challenges, if any, does the business face in sales and marketing of milk/milk products? ? Quais os desafios, se existem, que o negócio enfrenta nas vendas e no marketing de leite e produtos lácteos?</p> <p><i>*Please describe (open-ended) Por favor, descreva (abertamente)</i></p> |

| VARIABLE    | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_sales_19 | <p>How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address any sales and marketing challenges? <i>Como é que o vosso negócio tentou resolver esses desafios? O que funcionou, o que não funcionou? O projeto MERCADO ajudou de alguma forma a resolver os desafios de vendas e marketing?</i></p> <p><i>*If no challenges, skip question Se não houver desafios, deixe esta questão</i></p> <p><i>*Please describe (open-ended) Por favor, descreva (abertamente)</i></p> |
| Co_sales_20 | <p>What does the business think will be necessary to successfully tackle challenges related to selling milk? <i>O que a empresa acha que será necessário para enfrentar com sucesso os desafios relacionados com a venda do leite?</i></p> <p><i>*If no challenges, skip question Se não houver desafios, deixe esta questão</i></p> <p><i>*Please describe (open-ended) Por favor, descreva (abertamente)</i></p>                                                                                                                                                |



| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       | ENUMERATOR INSTRUCTIONS                                                              |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------|
| Co_sales_21 | <p>Have you seen any changes in milk/milk product sales since your participation in the MERCADO project, if at all? <b>Tem notado mudanças na venda do leite e dos produtos de laticínios devido a vossa participação no projecto MERCADO?</b></p> <p>1 Increased <b>Aumentou</b><br/> 2 Decreased <b>Diminuiu</b><br/> 3 Stayed the same <b>Ficou na mesma</b><br/> -99 Do not know/refuse to answer→<br/> co_sales_23 <b>Não sabe / se recusa a responder</b></p> | I__I  | *Select one option <b>selecione apenas uma opção</b>                                 |
| Co_sales_22 | <p>Why do you think milk sales changed because of the MERCADO project? <b>Porquê julga que as vendas de leite mudaram por causa do projeto MERCADO?</b><br/> <i>*Please describe (open-ended) Por favor descreva abertamente</i></p>                                                                                                                                                                                                                                |       |                                                                                      |
| Co_sales_23 | <p>How was the volume of milk impacted by Cyclone Idai, if at all? <b>Como foi que o volume de leite foi afectado pelo ciclone Idai?</b></p> <p>1 Increased→ co_sales_25 <b>aumentou</b><br/> 2 Decreased <b>diminuiu</b><br/> 3 Stayed the same→ co_sales_25 <b>ficou na mesma</b><br/> -99 Do not know/refuse to answer→<br/> co_sales_25 <b>Não sabe / se recusa a responder</b></p>                                                                             | I__I  | *Select one option <b>selecione apenas uma opção</b>                                 |
| Co_sales_24 | <p>How many liters per month did your sales of milk/milk products decrease because of Cyclone Idai? <b>Quantos litros de vendas de leite/produtos de laticínios diminuíram por mês, devido ao ciclone Idai?</b></p>                                                                                                                                                                                                                                                 | _____ | *Enter -99 if do not know/refuse to answer <b>Digite - 99 se não sabe /se recusa</b> |
| Co_sales_25 | <p>How was the price received for your milk impacted by Cyclone Idai, if at all? <b>Como foi</b></p>                                                                                                                                                                                                                                                                                                                                                                | I__I  | *Select only one option <b>selecione apenas uma opção</b>                            |

| VARIABLE      |                                                                                                                                                                                                                                                                                                                           |       | ENUMERATOR INSTRUCTIONS                                                                     |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------|
|               | <p>que o preço recebido por litro de leite foi afectado pelo ciclone Idai?</p> <p>1 Increased→ co_sales_26_1<br/>aumentou</p> <p>2 Decreased <b>diminiu</b></p> <p>3 Stayed the same→ co_sales_27<br/>ficou na mesma</p> <p>-99 Do not know/refuse to answer→<br/>co_sales_27 <b>Não sabe / se recusa a responder</b></p> |       |                                                                                             |
| Co_sales_26   | <p>How many meticals/liter of milk did the price received by you decrease because of Cyclone Idai? <b>Quantos meticais / litro de leite, o preço recebido diminuiu, devido ao ciclone Idai?</b></p>                                                                                                                       | _____ | <p>*Enter -99 if do not know/refuse to answer <b>Digite - 99 se não sabe /se recusa</b></p> |
| Co_sales_26_1 | <p>How many meticals/liter of milk did the price received by you increase because of Cyclone Idai? <b>Repetido</b></p>                                                                                                                                                                                                    | _____ | <p>*Enter -99 if do not know/refuse to answer <b>Digite - 99 se não sabe /se recusa</b></p> |

| VARIABLE    |  | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_sales_27 |  | <p>What other challenges have you faced in milk sales as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term? <b>Que outros desafios enfrentou nas vendas de leite como resultado do Cyclone Idai? Você acha que os efeitos que você acabou de descrever são de curto ou longo prazo?</b></p> <p><i>*Please describe (open-ended) Por favor descreva abertamente</i></p> |

### SECTION 3: MILK QUALITY TESTING

**[Transition]: Enumerator: Now let's talk about milk quality checks and milk testing on incoming milk** *Inquiridor: Agora vamos falar sobre o control da qualidade do leite e os testes do leite recebido*

| VARIABLE                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                              | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_qual_1                                                                                                                                                                                                                                                                                                                                   | Does the business do any quality testing on incoming milk you procure? <b>Fazem algum teste de qualidade ao leite que recebem das vossas compras?</b><br>1 Yes→ co_qual_2 <b>sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                           | <input type="checkbox"/>                                                                                                                                                                                                     | *Select only one option<br><b>selecione apenas uma opção</b>                                                                                                                                                                        |
| Co_qual_1_1                                                                                                                                                                                                                                                                                                                                 | Why do you not do any quality testing on incoming milk? <b>Porquê não fazem nenhum teste de qualidade do leite recebido?</b><br><i>*Please describe (open-ended) Por favor descreva abertamente</i>                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                     |
|  If respondent does not do milk quality testing, skip rest of the questions in this section and move to Section 4. <b>Se o entrevistado não faz nenhum teste de qualidade ao leite, deixe o resto das questões desta secção e passe para a secção 4.</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                     |
| Co_qual_2                                                                                                                                                                                                                                                                                                                                   | What do you test for? <b>Que testes fazem?</b><br>1 Water adulteration <b>adulteração com água</b><br>2 Bacteria <b>bactérias</b><br>3 Butter and fat content <b>conteúdo de gordura</b><br>4 Antibiotic residue <b>resíduos de antibióticos</b><br>5 pH testing <b>teste de pH</b><br>6 Testing for mastitis <b>teste de mastitis</b><br>7 Testing for freshness of milk<br>8 Other, specify _____<br><b>Outros, especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | *Select all that apply<br><b>Selecione tudo que se aplica</b><br>*Prompt with responses<br>*Ensure that if "-99" is chosen, no other option is chosen <b>Assegure-se que se "99" for escolhido, nenhuma outra opção é escolhida</b> |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                   |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_qual_3 | <p>Do you test all deliveries, do random testing, or test on an ad hoc basis? <b>Vocês testam a totalidade do leite entregue, fazem por amostragem ou “ad hoc”?</b></p> <p>1 Test all deliveries <b>testa a totalidade das entregas</b></p> <p>2 Random check <b>controla por amostragem</b></p> <p>3 Ad-hoc/judgement basis <b>Ad-hoc</b></p> <p>4 Other, specify <b>Outros, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <input type="text"/>                                                                                                                                                 | <p><b>*Select only one option<br/>selecione apenas uma opção</b></p>                                                                                                                                                                                                                              |
| Co_qual_4 | <p>What instruments did your business use for testing milk during the collection process in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Que instrumentos usaram para testar o leite durante o processo recolha nos últimos 12 meses (1 de Julho 2018 a 30 de Junho 2019)</b></p> <p>1 No instruments <b>Nenhum instrumento</b></p> <p>2 Taste, smell, visual observation <b>Prova, cheiro e observação visual</b></p> <p>3 Milk density (use of lactometer) <b>Densidade do leite (uso de lactodensímetro)</b></p> <p>4 Clot-on boiling tests <b>teste de fervura</b></p> <p>5 Gerber tests for fat <b>Teste Gerber para a gordura</b></p> <p>6 pH tests level of acidity (lactic acid in mill) <b>Teste de pH, nível de acidez (ácido láctico)</b></p> <p>7 Temperature <b>temperatura</b></p> <p>8 Other, specify _____ <b>Outros, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p> | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/> | <p><b>*Select all that apply<br/>Selecione tudo que se aplica</b></p> <p><b>*Read from list <b>Leia a lista</b></b></p> <p><b>*Ensure if “0” or “99” options are chosen, no other option is selected<br/>Assegure-se que se “99” ou “0” forem escolhidos, nenhuma outra opção é escolhida</b></p> |
| Co_qual_5 | <p>Has your business rejected any milk on safety and/or quality grounds in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A empresa/cooperativa rejeitou leite por confiabilidade e/ou qualidade nos últimos 12 meses (1 de Julho de 2018 a 30 de Junho de 2019)</b></p> <p>1 Yes <b>sim</b></p> <p>2 No→co_qual_8 <b>não</b></p> <p>-99 Do not know/refuse to answer→co_qual_8 <b>Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <input type="text"/>                                                                                                                                                 | <p><b>*Select only one option<br/>selecione apenas uma opção</b></p>                                                                                                                                                                                                                              |
| Co_qual_6 | <p>On average, what percentage of incoming milk did the business reject on quality grounds during the previous dry season (May through October 2018)? <b>Em média, que percentagem do leite recebido foi rejeitado por qualidade durante a época seca passada (Maio a Outubro de 2018)?</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input type="text"/>                                                                                                                                                 | <p><b>*Ensure only numbers between 0 and 100 can be entered <b>Assegure-se que só podem ser inseridos números entre 0 a 100</b></b></p>                                                                                                                                                           |

|           |                                                                                                                                                                                                                                                                                                                                  |       |                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |                                                                                                                                                                                                                                                                                                                                  |       | <p>*Enter -99 if do not know/refuse Digite -99 se não sabe /se recusa</p> <p>*If they have records for this, then ask them to show their records and fill out from record, else ask the question</p> <p>Se tiverem livro de registos, peça para mostrarem os registos e preencha com base nestes, se não, faça as perguntas</p>                                                               |
| Co_qual_7 | <p>On average, what percentage of incoming milk did the business reject on quality grounds during the last rainy season (November 2018 through April 2019)? Em média, que percentagem do leite recebido foi rejeitado por qualidade durante a última época chuvosa (Novembro 2018 a Abril 2019)?</p>                             | _____ | <p>*Ensure only numbers between 0 and 100 can be entered</p> <p>*Enter -99 if do not know/refuse Digite -99 se não sabe /se recusa</p> <p>*If there have records for this, then ask them to show their records and fill out from record, else ask the question</p> <p>Se tiverem livro de registos, peça para mostrarem os registos e preencha com base nestes, se não, faça as perguntas</p> |
| Co_qual_8 | <p>Does the business adjust the price paid for milk on the basis of any quality parameters (e.g. milk freshness) A empresa/cooperative paga o leite com base nos parametros de qualidade (p.ex. frescura do leite)</p> <p>1 Yes sim</p> <p>2 No não</p> <p>-99 Do not know/refuse to answer Não sabe / se recusa a responder</p> | I__I  | <p>*Select only one option<br/>selecione apenas uma opção</p>                                                                                                                                                                                                                                                                                                                                 |

|            |                                                                                                                                                                                                                                                                                                                                             |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_qual_9  | <p>How is the price adjusted? <b>Como é ajustado o preço do leite?</b><br/> <i>*Please describe (open-ended) Por favor descreva abertamente</i></p>                                                                                                                                                                                         |
| Co_qual10  | <p>Did you make any change to your milk-testing procedures based on any training you received? If so, what training? How? <b>Fizeram alguma mudança nos procedimentos de testagem do leite com base em algum treino recebido? Se sim, qual treino? E como?</b><br/> <i>*Please describe (open-ended) Por favor descreva abertamente</i></p> |
| Co_qual_11 | <p>Is any of the milk you sell rejected on quality grounds? <b>Tiveram alguma rejeição por qualidade no leite que venderam?</b><br/> <i>*Please describe (open-ended) Por favor descreva abertamente</i></p>                                                                                                                                |

## SECTION 4: EQUIPMENT, FINANCE, AND INVESTMENTS

**[Transition]:** Enumerator: Now, we want to talk about your equipment, financing, and investments **Inquiridor:** Agora, gostaríamos de falar acerca dos vossos equipamento, financiamento e investimentos

| VARIABLE                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>[Transition]:</b> Enumerator: Let's first talk about the equipment you currently own <b>Vamos primeiro falar do equipamento que possuem actualmente</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                      |                                                                                                                                                                                                                                |
| Co equip_1                                                                                                                                                                               | What types of major equipment and facilities do you have? <b>Que tipos de equipamentos e instalações importantes possuem?</b><br>1 Bulk milk tank <b>tanque para leite</b><br>2 Pasteurizer <b>Pasteurizador</b><br>3 Chilling system <b>Sistema de refrigeração</b><br>4 Bulk fridge retails <b>Tanques refrigeradores de vendas a retalho</b><br>5 Value-adding technology (please specify) _____ <b>Tecnologia que acrescenta valor (por favor especifique)</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | *Select all that apply <b>Selecione tudo que se aplica</b><br>*Prompt with options<br>*Ensure that if "-99" is chosen, no other option is chosen <b>Assegure-se que se "99" for escolhido, nenhuma outra opção é escolhida</b> |
| <b>[Enumerator instruction]:</b> For each <<type of major equipment>>, ask the following questions. Ask questions "co equip_2 – co equip_6" for applicable options selected in "equip_1" |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                      |                                                                                                                                                                                                                                |
| Co equip_2\$1<br>Co equip_2\$2<br>Co equip_2\$3<br>Co equip_2\$4<br>Co equip_2\$5                                                                                                        | How many of <<type of major equipment>> do you own? <b>Quantos tipos de «equipamento principal» possuem?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                   | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>                             | *Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b>                                                                                                                                            |
| Co equip_3\$1<br>Co equip_3\$2<br>Co equip_3\$3<br>Co equip_3\$4<br>Co equip_3\$5                                                                                                        | Is the <<type of major equipment>> currently in working order? <b>O tipo de «equipamento principal» está actualmente funcional?</b><br>1 Yes <b>sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                         | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>                             | *Select only one option <b>selecione apenas uma opção</b>                                                                                                                                                                      |
| Co equip_4\$1<br>Co equip_4\$2<br>Co equip_4\$3<br>Co equip_4\$4<br>Co equip_4\$5                                                                                                        | What is the total capacity of <<type of major equipment>> in the last 12 months (July 1, 2018 – June 30, 2019)? <b>(in m³) Qual foi a capacidade total do tipo de «equipamento principal» nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)? (em m³)</b>                                                                                                                                                                                                                                                                         | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>                             | *Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b>                                                                                                                                            |
| Co equip_5\$1<br>Co equip_5\$2<br>Co equip_5\$3                                                                                                                                          | In what year was <<type of major equipment>> installed? <b>Em que ano foi instalado o «equipamento principal»?</b>                                                                                                                                                                                                                                                                                                                                                                                                                             | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>                                                                                     | *Enter -99 if do not know/refuse to answer                                                                                                                                                                                     |



| VARIABLE                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                          |              | ENUMERATOR INSTRUCTIONS                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------|
| Co equip_5\$4<br>Co equip_5\$5                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                          | I__I<br>I__I | Digite -99 se não sabe /se recusa                             |
| Co equip_6                                                                                                                                   | Have you seen any change in purchase or improvement of any of the equipment you just talked about since participation in the MERCADO project, if at all? <i>Tem notado alguma mudança ou melhoria em algum dos equipamentos que falamos, desde a participação no projecto MERCADO?</i><br><i>*Please describe (open-ended) Por favor descreva abertamente</i>                                                            |              |                                                               |
| <i>[Transition]: Enumerator: Now I want to ask you questions about your investments Agora quero fazer perguntas sobre seus investimentos</i> |                                                                                                                                                                                                                                                                                                                                                                                                                          |              |                                                               |
| Co_invest_1                                                                                                                                  | Did your business make any investments in your dairy enterpirse in the last 12 months (July 1, 2018 – June 30, 2019)? <i>A sua empresa/cooperativa realizou algum investimento no seu sector leiteiro nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</i><br>1 Yes <i>sim</i><br>2 No→co_invest_5 <i>não</i><br>-99 Do not know/refuse to answer→co_invest_5<br><i>Não sabe / se recusa a responder</i> | I__I         | <i>*Select only one option<br/>selecione apenas uma opção</i> |

| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       | ENUMERATOR<br>INSTRUCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_invest_2 | <p><i>*Ask if co_invest_1=1</i></p> <p>What investments did the business make? <i>Quais foram os investimentos que fez?</i></p> <p><i>*Please describe (open-ended) Por favor descreva abertamente</i></p>                                                                                                                                                                                                                                                                 |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Co_invest_3 | <p>In total, how much did your business spend in new investments in the last 12 months (July 1, 2018 – June 30, 2019)? )? <i>No total, quanto a sua empresa/cooperativa gastou em novos investimentos nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</i></p>                                                                                                                                                                                             | _____ | <p><i>*Explain that this could mean expenditure on new machinery, new software, new marketing investments, new vehicles etc. Explique que são despesas com nova maquinaria, novo software, investimentos novos em marketing, novos veículos, etc.</i></p> <p><i>*Enter -99 if don't know/refuse Digite -99 se não sabe /se recusa</i></p> <p><i>*If multiple investments were made, enter total amount invested in last 12 months Se foram feitos vários investimentos, insira o valor total gasto nos últimos 12 meses</i></p> |
| Co_invest_4 | <p>What was the main source of financing for the investments in the last 12 months (July 1, 2018 – June 30, 2019)? <i>Qual foi a principal fonte de financiamento para os investimentos nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</i></p> <ol style="list-style-type: none"> <li>1 Self-financed <i>Auto financiamento</i></li> <li>2 Informal sources (family, neighbours, friends) <i>Fontes informais (familia, vizinhos, amigos)</i></li> </ol> | I__I  | <p><i>*Select only one option selecione apenas uma opção</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| VARIABLE                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                      | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                   | 3 Formal loans (banks etc.) <b>Empréstimos formais (bancos, etc.)</b><br>4 Grant <b>Donativos</b><br>5 Other, specify _____ <b>Outros, especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                                                                                                                |                                      |                                                                                                                                                                                                        |
| Co_invest_5                                                                                                                                                       | Does the business have any specific plans to invest in new equipment in the coming year? <b>A empresa/cooperativa tem algum plano específico para investir em novos equipamentos no próximo ano?</b><br>1 Yes <b>sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                           | I__I                                 | *Select only one option <b>selecione apenas uma opção</b>                                                                                                                                              |
| <b>[Transition]: Enumerator: Great! Now, let's talk about your financing and credit</b> <b>Ótimo! Agora vamos falar acerca dos vossos financiamento e crédito</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                      |                                                                                                                                                                                                        |
| Co_credit_1                                                                                                                                                       | Did your business request or receive credit for any production costs in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A vossa empresa/cooperativa solicitou ou recebeu crédito para algum custo de produção nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes, applied and received → co_credit_3 <b>Sim, candidatou-se e recebeu</b><br>2 Yes, applied and did not receive <b>Sim, candidatou-se e não recebeu</b><br>3 No have not applied → co_credit_7 <b>Não se candidatou</b><br>-99 Do not know/refuse to answer → co_credit_7 <b>Não sabe / se recusa a responder</b> | I__I                                 | *Select only one option <b>selecione apenas uma opção</b><br>*Ensure that if “-99” is chosen, no other option is chosen <b>Assegure-se que se “99” for escolhido, nenhuma outra opção é escolhida</b>  |
| Co_credit_2                                                                                                                                                       | Why did your business not receive any loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Porquê sua empresa/cooperativa não recebeu empréstimos de fontes formais nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 No formal financial institution present <b>Nenhuma instituição financeira formal esteve presente</b><br>2 Lack of collateral <b>Falta de garantia</b><br>3 High interest rate <b>alta taxa de juros</b><br>4 Other, specify <b>Outros , especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>   | I__I<br>I__I<br>I__I<br>I__I<br>I__I | *Select all that apply <b>Selecione tudo que se aplica</b><br>*Ensure that if “-99” is chosen, no other option is chosen <b>Assegure-se que se “99” for escolhido, nenhuma outra opção é escolhida</b> |

| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                 |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_credit_3 | <p>What were the primary purposes for obtaining loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quais foram os principais objetivos para obter empréstimos de fontes formais nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p> <ol style="list-style-type: none"> <li>1 Buying equipment for business <b>compra de equipamentos para o negócio</b></li> <li>2 Managing short-term cash shortage <b>Fazer face a falta de dinheiro a curto prazo</b></li> <li>3 Managing any unplanned shock to business <b>Gerir qualquer falha não planeada no negócio</b></li> <li>4 Business expansion <b>Expansão de negócios</b></li> <li>5 Other, specify <b>Outros , especifique</b></li> </ol> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> <p>*Ensure that if “-99” is chosen, no other option is chosen <b>Assegure-se que se “99” for escolhido, nenhuma outra opção é escolhida</b></p>                                                       |
| Co_credit_4 | <p>What is the total value of loans from formal sources that your business obtained in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Qual foi o valor total dos empréstimos de fontes formais que vossa empresa/cooperativa obteve nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | _____                                                                                                                                                                | <p>*Enter in Metical <b>Insira em meticais</b></p> <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p>                                                                                                                           |
| Co_credit_5 | <p>At what interest rate did you borrow in the last 12 months (July 1, 2018 – June 30, 2019)? Think about only loans from formal sources. <b>Que taxa de juro o empréstimo teve nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)? Pense apenas em empréstimos de fontes formais.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | _____                                                                                                                                                                | <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p> <p>*If interest rates differ across various sources, enter average interest rate <b>A taxa de juro varia entre várias fontes, insira a média das taxas de juro</b></p>       |
| Co_credit_6 | <p>What was the total cost of interest from paying off any business-related loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Qual foi o custo total dos juros do pagamento de empréstimos, relacionados com o negócio, de fontes formais nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | _____                                                                                                                                                                | <p>*Enter in Metical <b>Insira em meticais</b></p> <p>*Enter 0 if this expense was not incurred <b>Inserir “0” se a despesa não foi feita</b></p> <p>*Ensure total cost in last 12 months is quoted <b>Assegure que o custo total dos últimos 12 meses é cotado</b></p> |
| Co_credit_7 | <p>Has your business used any other financial products in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A vossa empresa/cooperativa usou algum outro produto</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>                                                                                     | <p>*Select all that apply <b>Selecione tudo que se aplica</b></p>                                                                                                                                                                                                       |

| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                 | ENUMERATOR INSTRUCTIONS                                                                                                                                                                         |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <p>financeiro nos últimos 12 meses (de 1 de julho de 2018 a 30 de junho de 2019)?</p> <p>1 No Não</p> <p>2 Business insurance Seguro Empresarial</p> <p>3 Livestock insurance Seguro de gado</p> <p>4 Mutual funds fundos de contrapartida</p> <p>5 Capital gain bonds títulos de ganho de capital</p> <p>6 Other, specify Outros , especifique</p> <p>-99 Do not know/refuse to answer Não sabe / se recusa a responder</p>                                                                                                                 | <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> | <p>*Prompt with options</p> <p>*Ensure that if “-99” or “no” is chosen, no other option is chosen</p> <p>Assegure-se que se “99” ou “Não” forem escolhidos, nenhuma outra opção é escolhida</p> |
| Co_credit_8 | <p>What financing challenges, if any, does the business face? Quais desafios de financiamento, se existentes, o negócio enfrenta?</p> <p><i>*Please describe (open-ended) Por favor, descreva abertamente</i></p>                                                                                                                                                                                                                                                                                                                            |                                                                                                                                 |                                                                                                                                                                                                 |
| Co_credit_9 | <p>How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address financing challenges? Como a empresa/cooperativa tentou resolver esses desafios? O que funcionou e o que não resultou? O projeto MERCADO terá ajudado, de alguma forma, a resolver os desafios do financiamento?</p> <p><i>*If no challenges, skip question Se não houve desafios, deixe esta questão</i></p> <p><i>*Please describe (open-ended) Por favor, descreva abertamente</i></p> |                                                                                                                                 |                                                                                                                                                                                                 |

| VARIABLE  |                                                                                                                                                                                                                                                                                                                                                                              | ENUMERATOR<br>INSTRUCTIONS |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Credit_10 | <p>What does the business think will be necessary to tackle these financing challenges? <i>O que a empresa/cooperativa acha que será necessário para enfrentar esses desafios de financiamento?</i></p> <p><i>*If no challenges, skip question Se não houve desafios, deixe esta questão</i></p> <p><i>*Please describe (open-ended) Por favor, descreva abertamente</i></p> |                            |

## **SECTION 5: STAFFING**

**[Transition]: Enumerator: Thank you! Now I want to ask you about your staffing. Muito obrigado! Agora queria fazer perguntas sobre os trabalhadores**

| VARIABLE                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                              | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_labor                                                                                                                                                                 | <p>Which of the following types of employees did your business employ in the last 12 months (July 1, 2018 – June 30, 2019)? Qual dos seguintes categorias de empregados vossa empresa/cooperativa empregou nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</p> <ol style="list-style-type: none"> <li>1 Full time permanent – Male Tempo inteiro permanente - Masculino</li> <li>2 Full-time permanent – Female Tempo inteiro permanente - feminino</li> <li>3 Part Time Permanent – Male Meio período permanente - masculino</li> <li>4 Part time permanent – Female Meio período permanente - feminino</li> <li>5 Full-time seasonal – Male Tempo inteiro sazonal-Masculino</li> <li>6 Full-time seasonal- Female Tempo inteiro sazonal-Feminino</li> <li>7 Part Time seasonal – Male meio periodo sazonal-masculino</li> <li>8 Part Time seasonal – Female meio periodo sazonal -feminino</li> <li>9 Other, specify _____ Outros, especifique</li> <li>-99 Do not know/refuse to answer Não sabe / se recusa a responder</li> </ol> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply<br/>Selecione tudo que se aplica</p> <p>*Ensure that if “-99” is chosen, no other option is chosen Assegure-se que se “99” for escolhido, nenhuma outra opção é escolhida</p> |
| <p>[Enumerator instruction]: For each &lt;&lt;type of employee&gt;&gt; please answer the following questions. Ask only for applicable options selected in “co_labor”</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                              |                                                                                                                                                                                                         |
| Co_labor0\$1<br>Co_labor0\$2<br>Co_labor0\$3<br>Co_labor0\$4<br>Co_labor0\$5<br>Co_labor0\$6<br>Co_labor0\$7<br>Co_labor0\$8<br>Co_labor0\$9                             | <p>Does the record book have information on the &lt;&lt;type of employee&gt;&gt; O vosso livro de registos tem informação sobre as categorias de empregados?</p> <ol style="list-style-type: none"> <li>1 Yes sim</li> <li>2 No não</li> <li>-99 Do not know/refuse to answer Não sabe / se recusa a responder</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select only one option<br/>selecione apenas uma opção</p>                                                                                                                                           |
| Co_labor1\$1<br>Co_labor1\$2                                                                                                                                             | <p>How many of the following &lt;&lt;types of employees&gt;&gt; did your business have in the last 12 months (July 1,</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <input type="checkbox"/><br><input type="checkbox"/>                                                                                                                                                                         | <p>*Enter -99 if number unknown but were</p>                                                                                                                                                            |

| VARIABLE                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Co_labor1\$3<br>Co_labor1\$4<br>Co_labor1\$5<br>Co_labor1\$6<br>Co_labor1\$7<br>Co_labor1\$8<br>Co_labor1\$9                                                   | 2018 – June 30, 2019)? <b>Quantos empregados das seguintes &lt;&lt; categorias de empregados &gt;&gt; a vossa empresa/cooperativa teve nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                                                                                                                                                              | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/>                                                 | employed at the business<br><b>Digite 99 se desconhece o número mas teve empregados</b>                                       |
| Co_labor1_1\$1<br>Co_labor1_1\$2<br>Co_labor1_1\$3<br>Co_labor1_1\$4<br>Co_labor1_1\$5<br>Co_labor1_1\$6<br>Co_labor1_1\$7<br>Co_labor1_1\$8<br>Co_labor1_1\$9 | How many new employees of the following <<types of employees>> did your business hire in the last 12 months (July 2018 – July 2019) as a result of participation in the MERCADO project? <b>Quantos novos empregados das seguintes &lt;&lt; categorias de empregados &gt;&gt; a vossa empresa/cooperativa contratou nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b> | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/> | *Enter -99 if number unknown but were employed at the business<br><b>Digite 99 se desconhece o número mas teve empregados</b> |
| Co_labor2\$1<br>Co_labor2\$2<br>Co_labor2\$3<br>Co_labor2\$4<br>Co_labor2\$5<br>Co_labor2\$6<br>Co_labor2\$7<br>Co_labor2\$8<br>Co_labor2\$9                   | On average, how many months in the year did your business hire <<types of employees>> in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Em média, quantos meses por ano a vossa empresa/ cooperativa contratou as seguintes &lt;&lt; categorias de empregados &gt;&gt; nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                       | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/> | *Enter -99 if number unknown but were employed at the business<br><b>Digite 99 se desconhece o número mas teve empregados</b> |
| Co_labor3\$1<br>Co_labor3\$2<br>Co_labor3\$3<br>Co_labor3\$4<br>Co_labor3\$5<br>Co_labor3\$6<br>Co_labor3\$7<br>Co_labor3\$8<br>Co_labor3\$9                   | On average, how many hours in a week did <<types of employees>> work in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Em média, quantas horas por semana os empregados das seguintes &lt;&lt; categorias de empregados &gt;&gt; trabalharam nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                                                 | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/> | *Enter -99 if number unknown but were employed at the business<br><b>Digite 99 se desconhece o número mas teve empregados</b> |
| Co_labor4\$1<br>Co_labor4\$2<br>Co_labor4\$3<br>Co_labor4\$4<br>Co_labor4\$5<br>Co_labor4\$6<br>Co_labor4\$7                                                   | What frequency of payment did you pay each <<type of employee>>? <b>Qual é forma de pagamento que usou para pagar cada &lt;&lt; categoria de empregado &gt;&gt;?</b><br>1 Hourly <b>por hora</b><br>2 Daily <b>por dia</b><br>3 Weekly <b>por semana</b><br>4 Monthly <b>mensal</b>                                                                                                      | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/>                                                 | *Select only one option<br><b>selecione apenas uma opção</b>                                                                  |



| VARIABLE                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co_labor4\$8<br>Co_labor4\$9                                                                                                                 | 5 Yearly <b>anual</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <input type="text"/><br><input type="text"/>                                                                                                                                                                         |                                                                                                                                                                                                                                                                 |
| Co_labor5\$1<br>Co_labor5\$2<br>Co_labor5\$3<br>Co_labor5\$4<br>Co_labor5\$5<br>Co_labor5\$6<br>Co_labor5\$7<br>Co_labor5\$8<br>Co_labor5\$9 | How much did you pay on average to each <<type of employee>> including benefits, in that type of payment? Think about the average wages paid only in the last 12 months. Please try to estimate if you do not know precise wages. <b>Quanto foi que pagou, em média, a cada &lt;&lt; categoria de empregado &gt;&gt; incluindo benefícios, nesse tipo de pagamento? Pense nos salários médios pagos apenas nos últimos 12 meses. Por favor, tente estimar se você não sabe os salários precisos.</b> | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/> | *Enter -99 if wages unknown <b>Digite 99 se desconhece os salários</b><br>*If different wages paid, calculate and enter average amount <b>Se foram pagos salários diferentes, calculi e digite o valor médio</b><br>*Enter in Metical <b>Insira em meticais</b> |

## SECTION 6: ADDITIONAL OPEN-ENDED QUESTIONS **Questões adicionais abertas**

1. What support from MERCADO has been most helpful to your business? Please explain. **Que apoio do projecto MERCADO tem sido mais útil para o vosso negócio? Por favor explique**
2. What support from MERCADO has not been helpful? What needs does your business have that are still unmet? How can MERCADO improve their support to your business? **Qual o apoio do MERCADO não tem sido útil? Quais são as necessidades da sua empresa/cooperatva que ainda não foram atendidas? Como a MERCADO pode melhorar seu apoio ao vosso negócio?**
3. Are there any challenges specifically faced by women in participating in your business that are not faced by men? Are there any kinds of support provided to overcome these challenges that you know of? **Há algum desafio específico enfrentado pelas mulheres que participam no vosso negócio e que não são enfrentadas pelos homens? Há algum tipo de apoio fornecido para superar esses desafios que você conhece?**
4. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today? **Existe alguma coisa que eu não terei perguntado e que você gostaria de compartilhar comigo, ou tem alguma opinião adicional sobre o que discutimos hoje?**

## 2. Processor Semi-Structured Survey

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|
| Interviewer name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |    |
| Interview date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |    |
| Interview time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |    |
| Firm name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |    |
| Respondent name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |    |
| Respondent position/title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |    |
| Respondent gender                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1 Male 2 Female   |    |
| Contact information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |    |
| GPS coordinates: latitude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |    |
| GPS coordinates: longitude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |    |
| Province:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 Manica 2 Sofala |    |
| Community                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |    |
| District:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |    |
| <b>INTRODUCTION:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |    |
| <p>Thank you for taking the time today to meet with me/us. I work for IMPAQ International, a US-based research company. Joining me is _____, who works for _____. Land O'Lakes International Development has contracted IMPAQ International to collect data for an evaluation of the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project.</p> <p><b>Present letter of introduction.</b></p> <p>Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique. We will be talking with every processor involved with the MERCADO project. Your answers will be kept confidential and will not be used for any purpose other in a report that will help inform the dairy project being implemented by Land O' Lakes.</p> <p>The interview should last about an hour. Participation is voluntary and you can choose not to take part. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer. Land O'Lakes would like you to feel free to be open and honest in your responses. Knowing the true situation in your dairy processing activities will help them provide better support to you in the future. There are no penalties to you for not participating or not answering a question. Neither your participation nor your responses will affect your ability to receive Land O'Lakes assistance now or in the future.</p> |                   |    |
| <b>Permission Question:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |    |
| <p><i>Before we begin, do you have any questions about the purpose of the evaluation or what will happen to the information? If it's ok, I would like to audio record the interview for note-taking accuracy. The only people who will have access to the recordings and interview notes are project researchers, who have taken a strict oath of confidentiality.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |    |
| Do I have your permission to conduct this interview?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Yes               | No |
| Do I have your permission to record this interview?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Yes               | No |

*If at any point you want me to turn off the tape recorder, please let me know and I'll be happy to comply*

## **SECTION 0: BACKGROUND ON BUSINESS AND ENGAGEMENT WITH MERCADO**

**[Transition]:** *Enumerator: First, we would like to talk to you about your business and your engagement with the MERCADO project*

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                             |                                                           |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| pr_back1  | Please provide a brief background on the cooperative/milk collection center<br><i>Please describe (open-ended)</i> <ul style="list-style-type: none"> <li>• Year of inception</li> <li>• Motivation for start-up</li> </ul>                                                                                                                                                                                                                                                         |                                                                                             |                                                           |
| pr_back2  | When and how did you begin work with MERCADO project?<br><i>Please describe (open-ended)</i> <ul style="list-style-type: none"> <li>• Year began work with MERCADO project</li> <li>• Motivation for work with MERCADO project</li> <li>• Major evolutions in nature or scale of work with MERCADO</li> </ul>                                                                                                                                                                       |                                                                                             |                                                           |
| Pr_train1 | What types of training has your business received in the last 12 months (July 1, 2018 – June 30 2019) from any source? <ol style="list-style-type: none"> <li>1 No training</li> <li>2 Milk handling</li> <li>3 Milk processing</li> <li>4 Milk storage and cooling</li> <li>5 Food safety training</li> <li>6 Milk testing training</li> <li>7 Business operations/Financial management</li> <li>8 Other, specify</li> <li>-99 Do not know/refuse to answer</li> </ol>             | *Select all that apply<br>*Ensure that if "0" or "99" are chosen, no other option is chosen | Indicators:<br>#36, #37,<br>#38, #39,<br>#40, #42,<br>#43 |
| Pr_train2 | From whom did your business receive this training in the last 12 months (July 1, 2018 – June 30 2019)? <ol style="list-style-type: none"> <li>1 Government agencies (national, state, local)</li> <li>2 Non-governmental organizations</li> <li>3 Land O' Lakes</li> <li>4 Other private companies</li> <li>5 Input suppliers</li> <li>6 Business development service providers</li> <li>7 Own staff</li> <li>8 Other, specify</li> <li>-99 Do not know/refuse to answer</li> </ol> | *Ask if pr_train1 = 1 -7<br>*Select all that apply                                          |                                                           |
| Pr_train3 | Thinking specifically about the training you've participated in from Land O'Lakes in the last 2 years, what were the training topics? what were your key learnings? Is there anything that you especially liked about this training? Are there any areas where you need more support?                                                                                                                                                                                               | *Ask if pr-train2 = 3                                                                       |                                                           |

|  |                              |  |  |
|--|------------------------------|--|--|
|  | Please describe (open-ended) |  |  |
|--|------------------------------|--|--|

## SECTION 1: RECORD KEEPING

**[Transition]: Enumerator: Thank you! Now we want to ask you about the records you keep for your business**

| VARIABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                                 | PMP INDICATOR        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------|
| pr_record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Did your business keep any kinds of records or logs in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse                                                                                                                                                                                                                                                                                                     | *Select only one option                                                 | Indicators: #37; #18 |
| pr_record1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Why do you not keep any kinds of records or logs for your business?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                                                                                                                                                                               | *Ask if pr_record=2                                                     |                      |
| pr_record2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | What types of records did you keep in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Income and expense ledger<br>2 Production ledgers ( <i>tracks inputs vs outputs</i> )<br>3 Labor<br>4 Equipment<br>5 Long range budgeting<br>6 rejections of incoming milk<br>7 Rejections of outgoing milk<br>8 Monthly cash flow statement<br>9 Milk collection from suppliers<br>10 Milk sales<br>11 Other, specify<br>-99 Do not know/refuse to answer | *Ask if pr_record = 1<br>*Select all that apply<br>*Prompt with options | Indicator: #18       |
| pr_record3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Did you start or change the way you keep records as a result of any training you received? If so, what training? How did it change?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                                                                                                               | *Ask if pr_train1 = 6                                                   |                      |
| <b>[Transition]: Enumerator: We want to really understand the revenues and costs of your business to understand how your business is doing. In order to do this, we need to ask you specific questions about your costs and revenues over the last year. If you have a monthly cash flow statement from last year (July 1, 2018 – June 30, 2019), it would be helpful if you get out the copy of your monthly cash flow statement so that we can talk about exact values. If not, then please try to provide accurate values.</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                         |                      |
| pr_cash2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Is it possible to provide a copy of the monthly cash flow statement from last year (July 1, 2018 – June 30, 2019)?                                                                                                                                                                                                                                                                                                                                       | *Ask if pr_record2 = 8<br>*Select only one option                       | Indicator: #18       |

| VARIABLE                                                                                                                                                          |                                                                                                                                                 | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                              | PMP INDICATOR |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                                   | 1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                               |                                                                                                                                                                                                                                                                                                                                      |               |
| <b>[Enumerator Instruction]:</b> If “pr_cash2 = 1” then fill the following questions using the monthly cash flow statement, else ask the respondent and the fill: |                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                      |               |
| pr_othercost_record1                                                                                                                                              | Does the cash flow statement have information on cost of utilities?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                        | *Ask if pr_record2 = 8<br>*Select only one option                                                                                                                                                                                                                                                                                    |               |
| pr_othercost1                                                                                                                                                     | What was the <b>average monthly cost</b> of utilities for your business over the last 12 months (July 1, 2018 – June 30, 2019)?                 | *If pr_othercost_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Ensure average monthly price in last 12 months is quoted<br>*Explain that utilities include costs for fuel, electricity and water<br>*Enter -99 if don't know/refuse<br>*Enter 0 if this expense was not incurred<br>*Enter in Metical |               |
| pr_othercost_record2                                                                                                                                              | Does the cash flow statement have information on rental costs of land/buildings/machinery?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Ask if pr_record2 = 8<br>*Select only one option                                                                                                                                                                                                                                                                                    |               |
| pr_othercost2                                                                                                                                                     | What was the total rental cost of lands and buildings in the last 12 months (July 1, 2018 – June 30, 2019)?                                     | *If pr_othercost_record2 = 1 then fill from record book, else ask respondent and fill out<br>*Ensure total cost in last 12 months is quoted<br>*Enter -99 if don't know/refuse<br>*Enter 0 if this expense was not incurred<br>*Enter in Metical                                                                                     |               |
| pr_othercost3                                                                                                                                                     | What was the total rental cost of machinery, vehicles and equipment                                                                             | *If pr_othercost_record2 = 1 then fill from record book,                                                                                                                                                                                                                                                                             |               |

| VARIABLE             |                                                                                                                                                                               | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                 | PMP INDICATOR |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                      | (including storage equipment) in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                           | <p>else ask respondent and fill out</p> <p>*Ensure total cost in last 12 months is quoted</p> <p>*Enter -99 if don't know/refuse</p> <p>*Enter 0 if this expense was not incurred</p> <p>*Enter in Metical</p> <p>*Explain: this could include milk testing costs</p>   |               |
| pr_othercost_record3 | <p>Does the cash flow statement have information on maintenance and repair costs?</p> <p>1 Yes</p> <p>2 No</p> <p>-99 Do not know/refuse to answer</p>                        | <p>*Ask if pr_record2 = 8</p> <p>*Select only one option</p>                                                                                                                                                                                                            |               |
| pr_othercost4        | <p>What was the total cost of maintenance and repair in the last 12 months (July 1, 2018 – June 30, 2019)?</p>                                                                | <p>*If pr_othercost_record3 = 1 then fill from record book, else ask respondent and fill out</p> <p>*Ensure total cost in last 12 months is quoted</p> <p>*Enter -99 if don't know/refuse</p> <p>*Enter 0 if this expense was not incurred</p> <p>*Enter in Metical</p> |               |
| pr_othercost_record4 | <p>Does the cash flow statement have information on cost of consumables (e.g. milk utensils)?</p> <p>1 Yes</p> <p>2 No</p> <p>-99 Do not know/refuse to answer</p>            | <p>*Ask if pr_record2 = 8</p> <p>*Select only one option</p>                                                                                                                                                                                                            |               |
| pr_othercost5        | <p>What was the total cost of consumables (e.g. milk utensils), including office consumables and other consumables, in the last 12 months (July 1, 2018 – June 30, 2019)?</p> | <p>*If pr_othercost_record4 = 1 then fill from record book, else ask respondent and fill out</p> <p>*Ensure total cost in last 12 months is quoted</p> <p>*Enter -99 if don't know/refuse</p> <p>*Enter 0 if this expense was not incurred</p> <p>*Enter in Metical</p> |               |

| VARIABLE                                                                                                                                                                          |                                                                                                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                                                                    | PMP INDICATOR |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                                                   |                                                                                                                                                                                                                          | *Explain: this could include costs for milk utensils                                                                                                                                                                                                                                                                       |               |
| pr_othercost_record5                                                                                                                                                              | Does the cash flow statement have information on cost of services to milk suppliers?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                | *Ask if pr_record2 = 8<br>*Select only one option                                                                                                                                                                                                                                                                          |               |
| pr_othercost6                                                                                                                                                                     | What was the total cost of all services to milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                          | *If pr_othercost_record5 = 1 then fill from record book, else ask respondent and then fill out<br>*Enter in Metical<br>*Enter 0 if there was no cost<br>*Enter -99 if do not know/refuse to answer<br>*If there have records for this, then ask them to show their records and fill out from record, else ask the question |               |
| pr_othercost_record6                                                                                                                                                              | Does the cash flow statement have information on transportation costs?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                              | *Ask if pr_record2 = 8<br>*Select only one option                                                                                                                                                                                                                                                                          |               |
| <b>[Enumerator Instruction]: If pr_othercost_record6 = 1, then for questions pr_othercost7 – pr_othercost8, fill from the record book ; else ask respondent and then fill out</b> |                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                            |               |
| pr_othercost7                                                                                                                                                                     | What is the average monthly cost of transportation for your business in the last dry season (May through October 2018)?                                                                                                  | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer and "0" if no costs incurred                                                                                                                                                                                                                               |               |
| pr_othercost8                                                                                                                                                                     | What is the average monthly cost of transportation for your business in the last rainy season (November 2018 through April 2019)?                                                                                        | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer and "0" if no costs incurred                                                                                                                                                                                                                               |               |
| pr_othercost9_1                                                                                                                                                                   | Other than staff costs and milk purchase costs, that we will touch on later, what other costs of production in the last 12 months have we not included in the previous questions?<br><i>Please describe (open ended)</i> |                                                                                                                                                                                                                                                                                                                            |               |
| pr_othercost9_2                                                                                                                                                                   | Does the cash flow statement have information on these other costs?<br>1 Yes<br>2 No                                                                                                                                     | *Ask if pr_record2 = 8<br>*Select only one option                                                                                                                                                                                                                                                                          |               |

| VARIABLE        |                                                                                                                               | ENUMERATOR INSTRUCTIONS                                         | PMP INDICATOR |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------|
|                 | -99 Do not know/refuse to answer                                                                                              |                                                                 |               |
| pr_othercost9_3 | Which other costs does the cash flow have information about?<br><i>Please describe (open ended)</i>                           | *Ask if pr_othercost9_2 = 1                                     |               |
| pr_othercost9_4 | What were the other total costs of production that we have not included in the last 12 months (July 1, 2018 – June 30, 2018)? | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer |               |



## SECTION 2: PROCUMENT, PROCESSING, AND SALES

**[Transition]: Enumerator: Thank you! Now we want to talk to you about your procurement, processing, and sales of milk and milk products**

| VARIABLE                                                                                     |                                                                                                                                       |                            |                    |            | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                         | PMP INDICATOR    |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| [Transition]: Enumerator: First, let's talk about your procurement of milk and milk products |                                                                                                                                       |                            |                    |            |                                                                                                                                                                                                                                                                                 |                  |
| pr_procure_0                                                                                 | Did you procure any milk in the past 12 months (July 31, 2018 to June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer |                            |                    |            | *Select only one option<br>*If pr_procure_0 = 2 or -99; thank respondent and end the interview                                                                                                                                                                                  |                  |
| pr_procure_recor<br>d1                                                                       | Does the record book have information on procurement of milk?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                    |                            |                    |            | *Select only one option<br>*Ask if pr_record = 1                                                                                                                                                                                                                                |                  |
| Pr_procure_1                                                                                 | How much of the following types of milk did you procure in the last dry season (May through October 2018) comes from?                 |                            |                    |            | *Enter -99 if do not know/refuse to answer<br>*If milk then enter quantity in liters and price/liter<br>*If imported powder, then enter quantity in kilograms and price/kilogram<br>*If pr_procure_reco<br>rd1 = 1 then fill from record book, else ask respondent and fill out |                  |
|                                                                                              | Supplier Type                                                                                                                         | Quantity procured (liters) | # of supplie<br>rs | Price/unit |                                                                                                                                                                                                                                                                                 |                  |
|                                                                                              | Imported powder                                                                                                                       |                            |                    |            |                                                                                                                                                                                                                                                                                 |                  |
|                                                                                              | Raw milk from smallholde<br>r suppliers                                                                                               |                            |                    |            |                                                                                                                                                                                                                                                                                 |                  |
|                                                                                              | Raw milk from commercia<br>l suppliers                                                                                                |                            |                    |            |                                                                                                                                                                                                                                                                                 |                  |
|                                                                                              | Raw milk from cooperativ<br>es                                                                                                        |                            |                    |            |                                                                                                                                                                                                                                                                                 |                  |
|                                                                                              | Other, specify                                                                                                                        |                            |                    |            |                                                                                                                                                                                                                                                                                 |                  |
| Pr_procure_2                                                                                 | What volume of milk has the business procured in the last dry season (May through October 2018)?                                      |                            |                    |            | *Enter in liters<br>*Enter -99 if do not know/refuse to answer<br>*If pr_procure_reco                                                                                                                                                                                           | Indicator:<br>#1 |

| VARIABLE     |                                                                                                                            |                                   |                       |                   | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                        | PMP INDICATOR |
|--------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|              |                                                                                                                            |                                   |                       |                   | rd1 = 1 then fill from record book, else ask respondent and fill out                                                                                                                                                                           |               |
| Pr_procure_3 | What was the average price paid to your suppliers during the dry season (May through October 2018)?                        |                                   |                       |                   | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out                                                                                     |               |
| Pr_procure_4 | What is the total value of milk procured by the business in the last dry season (May through October 2018)?                |                                   |                       |                   | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Check to ensure the total value is the product of pr_procure_2 and pr_procure_3 | Indicator: #1 |
| Pr_procure_5 | How much of the following types of milk did you procure in the last rainy season (November 2018 to April 2019) comes from? |                                   |                       |                   | *Enter -99 if do not know/refuse to answer<br>*If milk then enter quantity in liters and price/liter<br>*If imported powder, then enter quantity in kilograms and price/kilogram                                                               |               |
|              | <b>Supplier Type</b>                                                                                                       | <b>Quantity procured (Liters)</b> | <b># of suppliers</b> | <b>Price/unit</b> |                                                                                                                                                                                                                                                |               |
|              | Imported powder                                                                                                            |                                   |                       |                   |                                                                                                                                                                                                                                                |               |
|              | Raw milk from smallholder suppliers                                                                                        |                                   |                       |                   |                                                                                                                                                                                                                                                |               |

| VARIABLE     |                                                                                                                       |  |  |  | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                          | PMP INDICATOR |
|--------------|-----------------------------------------------------------------------------------------------------------------------|--|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|              | Raw milk from cooperatives                                                                                            |  |  |  | *If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out                                                                                                                          |               |
|              | Raw milk from commercial suppliers                                                                                    |  |  |  |                                                                                                                                                                                                                  |               |
|              | Other, specify                                                                                                        |  |  |  |                                                                                                                                                                                                                  |               |
| Pr_procure_6 | What volume of milk has the business procured in the last rainy season (November 2018 through April 2019)?            |  |  |  | *Enter in liters<br>*Enter -99 if do not know/refuse to answer<br>*If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out                                                        | Indicator: #1 |
| Pr_procure_7 | What was the average price paid to your suppliers during the rainy season (November 2018 through April 2019)?         |  |  |  | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out                                                       |               |
| Pr_procure_8 | What is the total value of milk procured by the business in the last rainy season (November 2018 through April 2019)? |  |  |  | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Check to ensure the total value is the product of | Indicator: #1 |

| VARIABLE      |                                                                                                                                                                                            | ENUMERATOR INSTRUCTIONS                                                                                                  | PMP INDICATOR     |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------|
|               |                                                                                                                                                                                            | pr_procure_6<br>and<br>pr_procure_7                                                                                      |                   |
| Pr_procure_9  | What type of milk supply/supplier do you prefer?<br>Why?<br><i>Please describe (open-ended)</i>                                                                                            |                                                                                                                          |                   |
| Pr_procure_10 | What are the pros and cons of different types of milk suppliers?<br><i>Please describe (open-ended)</i>                                                                                    | <i>*Ask about price and quality</i>                                                                                      |                   |
| Pr_procure_11 | Did the business have any formal agreement with any of your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer      | <i>*Select only one option</i>                                                                                           | Indicator:<br>#23 |
| Pr_procure_12 | How many agreements did you have with your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                            | <i>*Ask if pr_procure_11 = 1<br/>*Enter -99 if do not know/refuse to answer</i>                                          | Indicator:<br>#23 |
| Pr_procure_13 | Did you provide any support services to your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                     | <i>*Select only one option<br/>*Explain: Services could include training, technical support, transport services etc.</i> |                   |
| Pr_procure_14 | Can you explain the types of support services you offered?<br><i>Please describe (open-ended)</i>                                                                                          | <i>*Ask if pr_procure_13=1</i>                                                                                           |                   |
| Pr_procure_15 | Why did you not provide any support services?<br><i>Please describe (open-ended)</i>                                                                                                       | <i>*Ask if pr_procure_13=2</i>                                                                                           |                   |
| pr_procure_16 | How is the milk transported from your suppliers?<br>1 Suppliers come to our doorstep<br>2 Business travels to buy milk from seller<br>3 Other, specify<br>-99 Do not know/refuse to answer | <i>*Select all that apply</i>                                                                                            |                   |
| Pr_procure_17 | What challenges, if any, does the business face in milk procurement?                                                                                                                       |                                                                                                                          |                   |

| VARIABLE      |                                                                                                                                                                                                                    | ENUMERATOR INSTRUCTIONS                                               | PMP INDICATOR |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------|
|               | <i>Please describe (open-ended)</i>                                                                                                                                                                                |                                                                       |               |
| Pr_procure_18 | How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address any procurement challenges?<br><i>Please describe (open-ended)</i> | *If no challenges, skip question                                      |               |
| Pr_procure_19 | What does the business think will be necessary to successfully tackle challenges related to milk procurement?<br><i>Please describe (open-ended)</i>                                                               | *If no challenges, skip question                                      |               |
| pr_procure_20 | Have you seen any changes in milk procurement since participation in the MERCADO project, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                        | *Select one option<br>*If pr_procure_20 = -99, go to pr_procure_22    |               |
| pr_procure_21 | Why do you think milk procurement changed because of the MERCADO project?<br><i>Please describe (open ended)</i>                                                                                                   |                                                                       |               |
| Pr_procure_22 | How was the volume of milk procured from your suppliers impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                                | *Select only one option                                               | Indicator: #1 |
| Pr_procure_23 | How many liters per month did your procurement decrease as a result of Cyclone Idai?                                                                                                                               | *Ask if pr_procure_22=2<br>*Enter -99 if do not know/refuse to answer |               |
| Pr_procure_24 | How was the price paid to your suppliers impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                                               | *Selection only one option                                            | Indicator: #1 |
| Pr_procure_25 | How many meticals/liter did the price paid to your suppliers decrease as a result of Cyclone Idai?                                                                                                                 | *Ask if pr_procure_24=2<br>*Enter -99 if do not know/refuse to answer |               |
| Pr_procure_26 | How many meticals/liter did the price paid to your suppliers increase as a result of Cyclone Idai?                                                                                                                 | *Ask if pr_procure_24=1<br>*Enter -99 if do not know/refuse to answer |               |

| VARIABLE                                                                                        |                                                                                                                                                                                                     | ENUMERATOR INSTRUCTIONS                                                                            | PMP INDICATOR  |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------|
| Pr_procure_27                                                                                   | What other challenges in milk procurement have you faced as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term?<br><i>Describe (open-ended)</i> |                                                                                                    |                |
| <b>[Transition]: Enumerator: Now let's talk about your processing of milk and milk products</b> |                                                                                                                                                                                                     |                                                                                                    |                |
| Pr_process_record                                                                               | Does the record book have information on milk processing?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                      | *Select only one option<br>*Ask if pr_record = 1                                                   |                |
| Pr_process_1                                                                                    | In the last dry season (May through October 2018) what volume of milk has the business processed?                                                                                                   | *Enter in liters<br>*Enter -99 if do not know/refuse to answer<br>*Ensure number is ≤ pr_procure_2 |                |
| Pr_process_2                                                                                    | What is the total capacity in liters that you could process on a daily basis on average, in the last dry season (May through October 2018)?                                                         | *Enter in liters<br>*Enter -99 if do not know/refuse to answer                                     |                |
| Pr_process_2_1                                                                                  | On average how many liters of processing capacity was utilized daily in the last dry season (May through October 2018)?                                                                             | *Enter in liters<br>*Enter -99 if do not know/refuse to answer                                     |                |
| Pr_process_3                                                                                    | In the last rainy season (November 2018 through April 2019) what volume of milk has the business processed?                                                                                         | *Enter in liters<br>*Enter -99 if do not know/refuse to answer<br>*Ensure number is ≤ pr_procure_6 |                |
| Pr_process_4                                                                                    | What is the total capacity in liters that you can process on a daily basis on average, in the last rainy season (November 2018 through April 2019)?                                                 | *Enter in liters<br>*Enter -99 if do not know/refuse to answer                                     |                |
| Pr_process_4_1                                                                                  | On average how many liters of processing capacity was utilized daily in the last rainy season (November 2018 through April 2019)?                                                                   | *Enter in liters<br>*Enter -99 if do not know/refuse to answer                                     |                |
| <b>[Transition]: Enumerator: Great! Now, let's talk about your milk and milk product sales</b>  |                                                                                                                                                                                                     |                                                                                                    |                |
| Pr_sales_1                                                                                      | Which of the following value-added activities does your business undertake?<br>0 No value-added activities<br>1 Processing                                                                          | *Select all that apply<br>*Ensure that if "0" is chosen no                                         | Indicator: #20 |

| VARIABLE         |                                                                                                                                                                                      |                 |             |            |                  | ENUMERATOR INSTRUCTIONS                                                                                                                                                                            | PMP INDICATOR |
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|                  | 2 Refrigeration/chilling<br>3 Pasteurization<br>4 Storage<br>5 Homogenization<br>6 Delivery to buyers<br>7 Other, specify<br>-99 Do not know/refuse to answer                        |                 |             |            |                  | other option is chosen                                                                                                                                                                             |               |
| Pr_sales_record1 | Does the record book have information on milk and milk product sales?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                           |                 |             |            |                  | *Select only one option<br>*Ask if pr_record = 1                                                                                                                                                   |               |
| Pr_sales_2       | In the last dry season (May through October 2018), what was the volume sold of each type of milk product (e.g. processed milk, yogurt, cheese, etc.) and the price/unit you receive? |                 |             |            |                  | *If sell more than 5 products, ask for 5 most important ones<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter “0” if no sales                    |               |
|                  | Product                                                                                                                                                                              | Specify product | Qty sold    | Price/unit | Unit             |                                                                                                                                                                                                    |               |
|                  | Product 1                                                                                                                                                                            |                 |             |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                    |               |
|                  | Product 2                                                                                                                                                                            |                 |             |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                    |               |
|                  | Product 3                                                                                                                                                                            |                 |             |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                    |               |
|                  | Product 4                                                                                                                                                                            |                 |             |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                    |               |
|                  | Product 5                                                                                                                                                                            |                 |             |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                    |               |
| Pr_sales_3       | What types of buyers has the business sold to – what is the total value sold to each buyer in the last dry season (May through October 2018)?                                        |                 |             |            |                  | *If more than 5 buyer types, ask for 5 most important ones<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter “0” if no sales<br>*Enter in Metical |               |
|                  | Buyer                                                                                                                                                                                | Specify buyer   | Total Value |            |                  |                                                                                                                                                                                                    |               |
|                  | Buyer 1                                                                                                                                                                              |                 |             |            |                  |                                                                                                                                                                                                    |               |
|                  | Buyer 2                                                                                                                                                                              |                 |             |            |                  |                                                                                                                                                                                                    |               |
|                  | Buyer 3                                                                                                                                                                              |                 |             |            |                  |                                                                                                                                                                                                    |               |
|                  | Buyer 4                                                                                                                                                                              |                 |             |            |                  |                                                                                                                                                                                                    |               |
|                  | Buyer 5                                                                                                                                                                              |                 |             |            |                  |                                                                                                                                                                                                    |               |
| Pr_sales_4       | What was the business’s <b>total value</b> of sales of all milk products in the last dry season (May through October 2018)?                                                          |                 |             |            |                  | *Enter in Metical                                                                                                                                                                                  | Indicator: #1 |

| VARIABLE   |                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                  | PMP INDICATOR |
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|            |                                                                                                                                                                      | *Enter -99 if do not know/refuse to answer<br>*Enter 0 if no sales<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out                                                              |               |
| Pr_sales_5 | What was the businesses' <b>total volume</b> of sales in liters of milk products such as milk and yogurt in the last dry season (May through October 2018)?          | *Enter in liters<br>*Enter 0 if no sales<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Ask only about sales of products which are measured in liters like milk and yogurt | Indicator: #2 |
| Pr_sales_6 | What was the businesses' <b>total volume</b> of sales in kilograms of milk products such as cheese in the last dry season (May through October 2018)?                | *Enter in liters<br>*Enter 0 if no sales<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Ask only about sales of products which are measured in kilograms like cheese       | Indicator: #2 |
| Pr_sales_7 | What is the volume sold of milk products (e.g. processed milk, yogurt, cheese, etc.) and the price/unit in the last rainy season (November 2018 through April 2019)? | *If sell more than 5 products, ask for 5 most important ones                                                                                                                                                             |               |



| VARIABLE    |                                                                                                                                                                       |                 |               |            |                  | ENUMERATOR INSTRUCTIONS                                                                                                                                                                          | PMP INDICATOR |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|             | Product                                                                                                                                                               | Specify product | Quantity sold | Price/unit | Unit             | *If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter 0 if no sales                                                                                    |               |
|             | Product 1                                                                                                                                                             |                 |               |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                  |               |
|             | Product 2                                                                                                                                                             |                 |               |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                  |               |
|             | Product 3                                                                                                                                                             |                 |               |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                  |               |
|             | Product 4                                                                                                                                                             |                 |               |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                  |               |
|             | Product 5                                                                                                                                                             |                 |               |            | 1 Kg<br>2 Liters |                                                                                                                                                                                                  |               |
| Pr_sales_8  | What types of buyers has the business sold to – what is the total value sold in the last rainy season (November 2018 through April 2019)?                             |                 |               |            |                  | *If more than 5 buyer types, ask for 5 most important ones<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter 0 if no sales<br>*Enter in Metical |               |
|             | Buyer                                                                                                                                                                 | Specify buyer   | Total Value   |            |                  |                                                                                                                                                                                                  |               |
|             | Buyer 1                                                                                                                                                               |                 |               |            |                  |                                                                                                                                                                                                  |               |
|             | Buyer 2                                                                                                                                                               |                 |               |            |                  |                                                                                                                                                                                                  |               |
|             | Buyer 3                                                                                                                                                               |                 |               |            |                  |                                                                                                                                                                                                  |               |
|             | Buyer 4                                                                                                                                                               |                 |               |            |                  |                                                                                                                                                                                                  |               |
| Pr_sales_9  | What was the businesses’ <b>total value</b> of sales of milk products in the last rainy season (November 2018 through April 2019)?                                    |                 |               |            |                  | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer<br>*Enter 0 if no sales<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out                 | Indicator: #1 |
|             |                                                                                                                                                                       |                 |               |            |                  |                                                                                                                                                                                                  |               |
|             |                                                                                                                                                                       |                 |               |            |                  |                                                                                                                                                                                                  |               |
|             |                                                                                                                                                                       |                 |               |            |                  |                                                                                                                                                                                                  |               |
|             |                                                                                                                                                                       |                 |               |            |                  |                                                                                                                                                                                                  |               |
|             |                                                                                                                                                                       |                 |               |            |                  |                                                                                                                                                                                                  |               |
| Pr_sales_10 | What was the businesses’ <b>total volume</b> of sales in liters of milk products such as milk and yogurt in the last rainy season (November 2018 through April 2019)? |                 |               |            |                  | *Enter in liters<br>*Enter 0 if no sales<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out                                                                | Indicator: #2 |
|             |                                                                                                                                                                       |                 |               |            |                  |                                                                                                                                                                                                  |               |

| VARIABLE    |                                                                                                                                                                                                              | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                            | PMP INDICATOR  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|             |                                                                                                                                                                                                              | *Ask only about sales of products which are measured in liters like milk and yogurt                                                                                                                                |                |
| Pr_sales_11 | What was the businesses' <b>total volume</b> of sales in kilograms of milk products such as cheese in the last rainy season (November 2018 through April 2019)?                                              | *Enter in liters<br>*Enter 0 if no sales<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Ask only about sales of products which are measured in kilograms like cheese | Indicator: #2  |
| Pr_sales_12 | Did the business have any agreement with a buyer in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                  | *Select only one option                                                                                                                                                                                            | Indicator: #23 |
| Pr_sales_13 | How many agreements did you have with buyers in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                           | *Ask if pr_sales_12 = 1<br>*Enter -99 if do not know/refuse to answer<br>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out                                                     | Indicator: #23 |
| Pr_sales_14 | How are milk/milk products transported to your buyers?<br>1 Buyer (processor etc.) comes to our doorstep<br>2 Business travels to sell milk to buyer<br>3 Other, specify<br>-99 Do not know/refuse to answer | *Select all that apply                                                                                                                                                                                             |                |

| VARIABLE      |                                                                                                                                                                                                                 | ENUMERATOR INSTRUCTIONS                                               | PMP INDICATOR |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------|
| Pr_sales_15   | What challenges, if any, does the business face in marketing milk and milk products?<br><i>Please describe (open-ended)</i>                                                                                     |                                                                       |               |
| Pr_sales_16   | How has the business tried to address these challenges? What has worked, what has not?<br>Has the MERCADO project helped you in any way to address marketing challenges?<br><i>Please describe (open-ended)</i> | *If no challenges, skip question                                      |               |
| Pr_sales_17   | What does the business think will be necessary to successfully tackle these challenges?<br><i>Please describe (open-ended)</i>                                                                                  | *If no challenges, skip question                                      |               |
| Pr_sales_18   | Have you seen any changes in milk /milk products sales since participation in the MERCADO project, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer            | *Select only one option                                               |               |
| Pr_sales_19a  | How do you think milk sales changed because of the MERCADO project?<br><i>Please describe (open ended)</i>                                                                                                      |                                                                       |               |
| Pr_sales_20_1 | How was the volume of milk sales impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                                                    | *Select only one option                                               | Indicator: #1 |
| Pr_sales_20_2 | How many liters per month did your sales decrease as a result of Cyclone Idai?                                                                                                                                  | *Ask if pr_sales_20_1=2<br>*Enter -99 if do not know/refuse to answer |               |
| Pr_sales_21_1 | How was the price received for your milk impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                                            | *Select only one option                                               | Indicator: #1 |
| Sales_21_2    | By how many meticals/liter did the price received by you decrease as a result of Cyclone Idai?                                                                                                                  | *Ask if pr_sales_21_1=2<br>*Enter -99 if do not know/refuse to answer |               |
| Pr_sales_22_1 | How was the volume of milk product (e.g. yogurt, cheese, etc.) sales impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased                                                                         | *Selection only one option                                            | Indicator: #1 |

| VARIABLE      |                                                                                                                                                                                                                       | ENUMERATOR INSTRUCTIONS                                                  | PMP INDICATOR    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------|
|               | 3 Stayed the same<br>-99 Do not know/refuse to answer                                                                                                                                                                 |                                                                          |                  |
| Pr_sales_22_2 | How many kilograms per month did your sales decrease as a result of Cyclone Idai?                                                                                                                                     | *Ask if<br>pr_sales_22_1=2<br>*Enter -99 if do not know/refuse to answer |                  |
| pr_sales_23_1 | How was the price received for your milk product (e.g. yogurt, cheese, etc. ) sales impacted by Cyclone Idai, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer       | *Select only one option                                                  | Indicator:<br>#1 |
| Pr_sales_23_2 | By how many meticals/kilogram did the price received by you for milk product sales decrease as a result of Cyclone Idai?                                                                                              | *Ask if<br>pr_sales_23_1=2<br>*Enter -99 if do not know/refuse to answer |                  |
| pr_sales_24   | What other challenges have you faced in milk and milk product sales as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term?<br><i>Please describe (open-ended)</i> |                                                                          |                  |

### SECTION 3: MILK QUALITY TESTING

**[Transition]: Enumerator: Now let's talk about milk quality checks and milk testing on incoming milk**

| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                                                                                         | ENUMERATOR INSTRUCTIONS                                                                                       | PMP                       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------|
| Pr_qual_1   | Does your business do any quality testing on incoming milk?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                                                                                                                        | *Select only one option<br>*If pr_qual_1=-99, go to pr_qual_5                                                 | Indicators: #25, #26      |
| Pr_qual_1_1 | Why do you not do any milk quality testing?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                                                                                                                                                                      | *Ask if pr_qual_1=1                                                                                           |                           |
| Pr_qual_2   | What do you test for?<br>1 Water adulteration<br>2 Bacteria<br>3 Butter and fat content<br>4 Antibiotic residue<br>5 pH testing<br>6 Testing for mastitis<br>7 Testing for freshness of milk<br>8 Other, specify<br>-99 Do not know/refuse to answer                                                                                                                                                                    | *Select all that apply<br>*Ask if pr_qual_1=1<br>*Prompt with responses                                       | Indicators: #25, #26      |
| Pr_qual_3   | Do you test all deliveries, do random testing, or test on an ad hoc basis?<br>1 Test all deliveries<br>2 Random check<br>3 Ad-hoc/judgement basis<br>-99 Do not know/refuse to answer                                                                                                                                                                                                                                   | *Select only one option<br>*Ask if pr_qual_1=1                                                                | Indicators: #25, #26      |
| Pr_qual_4   | What instruments did your business use for testing milk during the collection process in the last 12 months (July 2018 – July 2019)?<br>1 No instruments<br>2 Taste, smell, visual observation<br>3 Milk density (use of lactometer)<br>4 Clot-on boiling tests<br>5 Gerber tests for fat<br>6 pH tests level of acidity (lactic acid in mill)<br>7 Temperature<br>8 Other, specify<br>-99 Do not know/refuse to answer | *Ask if pr_qual_1=1<br>*Select all that apply<br>*Ensure if "0" option is chosen, no other option is selected | Indicators: #25, #26, #30 |
| Pr_qual_5   | Has your business rejected any milk on safety and/or quality grounds in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                                                                                                                         | *Select only one option                                                                                       | Indicators: #21, #25, #26 |

|           |                                                                                                                                                                    |                                                                                                                                                                                                                                           |                      |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Pr_qual_6 | On average, what percentage of incoming milk did your business reject on quality grounds during the last dry season (May through October 2018)?                    | *Ask if pr_qual_5= 1<br>*Ensure only numbers between 0 and 100 can be entered<br>*Enter -99 if do not know/refuse<br>*If there have records for this, then ask them to show their records and fill out from record, else ask the question | Indicators: #25, #26 |
| Pr_qual_7 | On average, what percentage of incoming milk did your business reject on quality grounds during the last rainy season (November 2018 through April 2019)?          | *Ask if pr_qual_5= 1<br>*Ensure only numbers between 0 and 100 can be entered<br>*Enter -99 if do not know/refuse                                                                                                                         |                      |
| Pr_qual_8 | Does the business adjust the price paid for milk on the basis of any quality parameters (e.g. milk freshness)<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option                                                                                                                                                                                                                   |                      |
| Pr_qual_9 | How is the price adjusted?<br><i>Please describe (open-ended)</i>                                                                                                  | *Ask if pr_qual_8=1                                                                                                                                                                                                                       |                      |
| Pr_qual10 | Did you make any change to your milk-testing procedures based on any training you received? If so, what training? How? <i>Please describe (open-ended)</i>         | *Ask if pr_train1 = 6                                                                                                                                                                                                                     |                      |

## SECTION 4: EQUIPMENT, FINANCE, AND INVESTMENTS

**[Transition]: Enumerator: Now, we want to talk about your equipment, financing, and investments**

| VARIABLE                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                             | ENUMERATOR INSTRUCTIONS                        | PMP INDICATOR             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------|
| <b>[Transition]: Enumerator: Let's first talk about the equipment you currently own</b>                                                                                                              |                                                                                                                                                                                                                                                                                                             |                                                |                           |
| Pr_equip_1                                                                                                                                                                                           | What types of major equipment and facilities do you have? <ol style="list-style-type: none"> <li>1 Bulk milk tank</li> <li>2 Pasteurizer</li> <li>3 Chilling system</li> <li>4 Bulk fridge retails</li> <li>5 Value-adding technology (please specify)</li> <li>-99 Do not know/refuse to answer</li> </ol> | *Select all that apply<br>*Prompt with options | Indicators: #13, #14, #27 |
| <b>[Enumerator instruction]: For each &lt;&lt;type of major equipment&gt;&gt;, ask the following questions. Ask questions "pr_equip_2 – pr_equip_6" for applicable options selected in "equip_1"</b> |                                                                                                                                                                                                                                                                                                             |                                                |                           |
| Pr_equip_2\$1<br>Pr_equip_2\$2<br>Pr_equip_2\$3<br>Pr_equip_2\$4<br>Pr_equip_2\$5                                                                                                                    | How many of <<type of major equipment>> do you own?                                                                                                                                                                                                                                                         | *Enter -99 if do not know/refuse to answer     |                           |
| Pr_equip_3\$1<br>Pr_equip_3\$2<br>Pr_equip_3\$3<br>Pr_equip_3\$4<br>Pr_equip_3\$5                                                                                                                    | Is the <<type of major equipment>> currently in working order? <ol style="list-style-type: none"> <li>1 Yes</li> <li>2 No</li> <li>-99 Do not know/refuse to answer</li> </ol>                                                                                                                              | *Select only one option                        |                           |
| Pr_equip_4\$1<br>Pr_equip_4\$2<br>Pr_equip_4\$3<br>Pr_equip_4\$4<br>Pr_equip_4\$5                                                                                                                    | What is the total capacity of <<type of major equipment>> in the last 12 months (July 1, 2018 – June 30, 2019)? (in m <sup>3</sup> )                                                                                                                                                                        | *Enter -99 if do not know/refuse to answer     | Indicator: #27            |
| Pr_equip_5\$1<br>Pr_equip_5\$2<br>Pr_equip_5\$3<br>Pr_equip_5\$4<br>Pr_equip_5\$5                                                                                                                    | In what year was <<type of major equipment>> installed?                                                                                                                                                                                                                                                     | *Enter -99 if do not know/refuse to answer     | Indicator: #27            |
| Pr_equip_6                                                                                                                                                                                           | Have you seen any changes in the purchase or improvement of any of the equipment you just talked about since participation in the MERCADO project, if at all?<br><i>Please describe (open-ended)</i>                                                                                                        |                                                |                           |
| <b>[Transition]: Enumerator: Now I want to ask you questions about your investments</b>                                                                                                              |                                                                                                                                                                                                                                                                                                             |                                                |                           |

| VARIABLE                                                                                |                                                                                                                                                                                                                                                                                         | ENUMERATOR INSTRUCTIONS                                                                                                                                                                                                                                                 | PMP INDICATOR  |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Pr_invest_1                                                                             | Did your business make any investments in its business in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                       | *Select only one option                                                                                                                                                                                                                                                 | Indicator: #31 |
| Pr_invest_2                                                                             | What investments did the business make?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                                          | *Ask if pr_invest_1=1                                                                                                                                                                                                                                                   |                |
| Pr_invest_3                                                                             | In total, how much did your business spend in new investments in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                                                                                     | *Ask if pr_invest_1=1<br>*Explain that this could mean expenditure on new machinery, new software, new marketing investments, new vehicles etc.<br>*Enter -99 if don't know/refuse<br>*If multiple investments were made, enter total amount invested in last 12 months | Indicator: #31 |
| Pr_invest_4                                                                             | What was the main source of financing for the investments in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Self-financed<br>2 Informal sources(family, neighbours, friends)<br>3 Formal loans (banks etc.)<br>4 Grant<br>5 Other, specify<br>-99 Do not know/refuse to answer | *Select only one option                                                                                                                                                                                                                                                 |                |
| Pr_invest_5                                                                             | Does the business have any specific plans to invest in new equipment in the coming year?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                                                           | *Select only one option                                                                                                                                                                                                                                                 |                |
| <b>[Transition]: Enumerator: Great! Now, let's talk about your financing and credit</b> |                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                         |                |



| VARIABLE    |                                                                                                                                                                                                                                                                                                                                                                                                                          | ENUMERATOR INSTRUCTIONS                                                                                                                                               | PMP INDICATOR  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Pr_credit_1 | <p>Did your business request or receive credit for any production costs in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <ol style="list-style-type: none"> <li>1 Yes, applied and received</li> <li>2 Yes, applied and did not receive</li> <li>3 No have not applied</li> <li>-99 Do not know/refuse to answer</li> </ol>                                                                                     | <p>*Select only one option</p> <p>*If pr_credit_1 = 1, go to pr_credit_3</p> <p>*If pr_credit_1 = 3 OR pr_credit_1 = -99, go to pr_credit_7</p>                       | Indicator: #33 |
| Pr_credit_2 | <p>Why did your business not receive any loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <ol style="list-style-type: none"> <li>1 No formal financial institution present</li> <li>2 Lack of collateral</li> <li>3 High interest rate</li> <li>4 Other, specify</li> <li>-99 Do not know/refuse to answer</li> </ol>                                                                 | <p>*Ask if pr_credit_1 = 2</p> <p>*Select all that apply</p>                                                                                                          |                |
| Pr_credit_3 | <p>What were the primary purposes for obtaining loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <ol style="list-style-type: none"> <li>1 Buying equipment for business</li> <li>2 Managing short-term cash shortage</li> <li>3 Managing any unplanned shock to business</li> <li>4 Business expansion</li> <li>5 Other, specify</li> <li>-99 Do not know/refuse to answer</li> </ol> | <p>*Ask if pr_credit_1 = 1</p> <p>*Select all that apply</p>                                                                                                          |                |
| Pr_credit_4 | <p>What is the total value of loans from formal sources that your business obtained in the last 12 months (July 1, 2018 – June 30, 2019)?</p>                                                                                                                                                                                                                                                                            | <p>*Ask if pr_credit_1 = 1</p> <p>*Enter in Metical</p> <p>*Enter -99 if do not know/refuse to answer</p>                                                             | Indicator: #33 |
| Pr_credit_5 | <p>At what interest rate did you borrow in the last 12 months (July 1, 2018 – June 30, 2019)? Think about only loans from formal sources</p>                                                                                                                                                                                                                                                                             | <p>*Ask if pr_credit_1 = 1</p> <p>*Enter -99 if do not know/refuse to answer</p> <p>*If interest rates differ across various sources, enter average interest rate</p> |                |
| Pr_credit_6 | <p>What was the total cost of interest from paying off any business-related loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)?</p>                                                                                                                                                                                                                                                          | <p>*Ask if pr_credit_1 = 1</p> <p>*Enter in Metical</p>                                                                                                               |                |

| VARIABLE      |                                                                                                                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                                                                                   | PMP INDICATOR |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------|
|               |                                                                                                                                                                                                                                                                      | *Enter 0 if this expense was not incurred<br>*Ensure total cost in last 12 months is quoted                               |               |
| Pr_credit_6_1 | What time was allocated for repayment?<br><i>Please describe (open-ended)</i>                                                                                                                                                                                        |                                                                                                                           |               |
| Pr_credit_7   | Has your business used any other financial products in the last 12 months (July 1, 2018 – June 30, 2019)?<br>0 No<br>1 Business insurance<br>2 Livestock insurance<br>3 Mutual funds<br>4 Capital gain bonds<br>5 Other, specify<br>-99 Do not know/refuse to answer | *Select all that apply<br>*Prompt with options<br>* Ensure if “0” or “99” options are chosen, no other option is selected |               |
| Pr_credit_8   | What financing challenges, if any, does the business face?<br><i>Please describe (open-ended)</i>                                                                                                                                                                    |                                                                                                                           |               |
| Pr_credit_9   | How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address financing challenges?<br><i>Please describe (open-ended)</i>                                                         | *If no challenges, skip question                                                                                          |               |
| Pr_credit_10  | What does the business think will be necessary to tackle these financing challenges?<br><i>Please describe (open-ended)</i>                                                                                                                                          | *If no challenges, skip question                                                                                          |               |

## SECTION 5: STAFFING

**[Transition]: Enumerator: Thank you! Now we want to talk to you about your staffing.**

| VARIABLE                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ENUMERATOR INSTRUCTIONS                                        | PMP INDICATOR |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------|
| Pr_labor                                                                                                                                                                  | <p>Which of the following types of employees did your business employ in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <ul style="list-style-type: none"> <li>1 Full-time permanent – Male</li> <li>2 Full-time permanent – Female</li> <li>3 Part-time permanent – Male</li> <li>4 Part-time permanent – Female</li> <li>5 Full-time seasonal – Male</li> <li>6 Full-time seasonal – Female</li> <li>7 Part-time seasonal – Male</li> <li>8 Part-time seasonal – Female</li> <li>9 Other, specify</li> <li>-99 Do not know/refuse to answer</li> </ul> | *Select all that apply                                         |               |
| <b>[Enumerator Instructions]: For each &lt;&lt;type of employee&gt;&gt; please answer the following questions. Ask only for applicable options selected in “pr_labor”</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                |               |
| pr_labor0\$1<br>pr_labor0\$2<br>pr_labor0\$3<br>pr_labor0\$4<br>pr_labor0\$5<br>pr_labor0\$6<br>pr_labor0\$7<br>pr_labor0\$8<br>pr_labor0\$9                              | <p>Does the record book have information on the &lt;&lt;type of employee&gt;&gt;</p> <ul style="list-style-type: none"> <li>3 Yes</li> <li>4 No</li> <li>-99 Do not know/refuse to answer</li> </ul>                                                                                                                                                                                                                                                                                                                                                             | *Select only one option                                        |               |
| pr_labor1\$1<br>pr_labor1\$2<br>pr_labor1\$3<br>pr_labor1\$4<br>pr_labor1\$5<br>pr_labor1\$6<br>pr_labor1\$7<br>pr_labor1\$8<br>pr_labor1\$9                              | <p>How many of the following &lt;&lt;types of employees&gt;&gt; did your business have in the last 12 months (July 1, 2018 – June 30, 2019)?</p>                                                                                                                                                                                                                                                                                                                                                                                                                 | *Enter -99 if number unknown but were employed at the business |               |
| pr_labor1_1\$1<br>pr_labor1_1\$2<br>pr_labor1_1\$3<br>pr_labor1_1\$4<br>pr_labor1_1\$5<br>pr_labor1_1\$6<br>pr_labor1_1\$7<br>pr_labor1_1\$8                              | <p>How many <b>new</b> employees of the following &lt;&lt;types of employees&gt;&gt; did your business hire in the last 12 months (July 2018 – July 2019) as a result of participation in the MERCADO project?</p>                                                                                                                                                                                                                                                                                                                                               | *Enter -99 if number unknown but were employed at the business |               |

| VARIABLE                                                                                                                                     |                                                                                                                                                                                                                                   | ENUMERATOR INSTRUCTIONS                                                                                          | PMP INDICATOR |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------|
| pr_labor1_1\$9                                                                                                                               |                                                                                                                                                                                                                                   |                                                                                                                  |               |
| pr_labor2\$1<br>pr_labor2\$2<br>pr_labor2\$3<br>pr_labor2\$4<br>pr_labor2\$5<br>pr_labor2\$6<br>pr_labor2\$7<br>pr_labor2\$8<br>pr_labor2\$9 | On average, how many months in the year did your business hire <<types of employees>> in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                       | *Enter -99 if number unknown but were employed at the business                                                   |               |
| pr_labor3\$1<br>pr_labor3\$2<br>pr_labor3\$3<br>pr_labor3\$4<br>pr_labor3\$5<br>pr_labor3\$6<br>pr_labor3\$7<br>pr_labor3\$8<br>pr_labor3\$9 | On average, how many hours in a week did <<types of employees>> work in the last 12 months (July 1, 2018 – June 30, 2019)?                                                                                                        | *Enter -99 if number unknown but were employed at the business                                                   |               |
| pr_labor4\$1<br>pr_labor4\$2<br>pr_labor4\$3<br>pr_labor4\$4<br>pr_labor4\$5<br>pr_labor4\$6<br>pr_labor4\$7<br>pr_labor4\$8<br>pr_labor4\$9 | What frequency of payment did you pay each <<type of employee>>?<br>1 Hourly<br>2 Daily<br>3 Weekly<br>4 Monthly<br>5 Yearly                                                                                                      | *Select only one option                                                                                          |               |
| pr_labor5\$1<br>pr_labor5\$2<br>pr_labor5\$3<br>pr_labor5\$4<br>pr_labor5\$5<br>pr_labor5\$6<br>pr_labor5\$7<br>pr_labor5\$8<br>pr_labor5\$9 | How much did you pay on average to each <<type of employee>> including benefits, in that type of payment? Think about the average wages paid only in the last 12 months. Please try to estimate if you do not know precise wages. | *Enter -99 if wages unknown<br>*If different wages paid, calculate and enter average amount<br>*Enter in Metical |               |

## **SECTION 6: ADDITIONAL OPEN-ENDED QUESTIONS**

1. What support from MERCADO has been most helpful to your business? Please explain.
2. What support from MERCADO has not been helpful? What needs does your business have that are still unmet? How can MERCADO improve their support to your business?

3. Are there any challenges specifically faced by women in participating in your business that are not faced by men? Are there any kinds of support provided to overcome these challenges that you know of?
4. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

## 1. Processor Semi-Structured Survey (Portuguese Version)

|                                                                      |                                                     |                      |                                                              |
|----------------------------------------------------------------------|-----------------------------------------------------|----------------------|--------------------------------------------------------------|
| Interviewer name<br><b>Nome do entrevistador</b>                     |                                                     |                      |                                                              |
| Interview date <b>Data da entrevista</b>                             |                                                     |                      |                                                              |
| Interview time <b>Hora da entrevista</b>                             |                                                     |                      |                                                              |
| Firm name <b>Nome da firma</b>                                       |                                                     |                      |                                                              |
| Respondent name<br><b>Nome do entrevistado</b>                       |                                                     |                      |                                                              |
| Respondent position/title<br><b>Posição / título do entrevistado</b> |                                                     |                      |                                                              |
| Respondent gender<br><b>gênero do entrevistado</b>                   | 1 Male <b>Masculino</b><br>2 Female <b>Feminino</b> | <input type="text"/> | *Select only one option<br><b>Selecione apenas uma opção</b> |
| Contact information<br><b>Informações de contato</b>                 |                                                     |                      |                                                              |
| GPS coordinates:<br>latitude<br><b>Coordenadas GPS: latitude</b>     |                                                     |                      |                                                              |
| GPS coordinates:<br>longitude<br><b>Coordenadas GPS: longitude</b>   |                                                     |                      |                                                              |
| Province: <b>Província:</b>                                          | 1 Manica<br>2 Sofala                                | <input type="text"/> | *Select only one option<br><b>Selecione apenas uma opção</b> |
| District: <b>Distrito:</b>                                           |                                                     |                      |                                                              |
| Community:<br><b>Comunidade</b>                                      |                                                     |                      |                                                              |
| <b>INTRODUCTION: INTRODUÇÃO:</b>                                     |                                                     |                      |                                                              |

Thank you for taking the time today to meet with me/us. I work for IMPAQ International, a US-based research company. Joining me is \_\_\_\_\_, who works for \_\_\_\_\_. Land O'Lakes International Development has contracted IMPAQ International to collect data for an evaluation of the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project.

**Present letter of introduction.**

Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique. We will be talking with every processor involved with the MERCADO project. Your answers will be kept confidential and will not be used for any purpose other in a report that will help inform the dairy project being implemented by Land O' Lakes.

The interview should last about an hour. Participation is voluntary and you can choose not to take part. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer. Land O'Lakes would like you to feel free to be open and honest in your responses. Knowing the true situation in your dairy processing activities will help them provide better support to you in the future. There are no penalties to you for not participating or not answering a question. Neither your participation nor your responses will affect your ability to receive Land O'Lakes assistance now or in the future.

Obrigado por dispensar tempo hoje para se encontrar comigo / conosco. Eu trabalho para a IMPAQ International, uma empresa de pesquisa sediada nos EUA. Quem vai juntar-se a mim é \_\_\_\_\_, que trabalha para \_\_\_\_\_. A Land O'Lakes International Development contratou o IMPAQ Internacional para a recolha de dados para uma avaliação do projeto de Expansão de Rurais e Oportunidades de Leite em Moçambique (chamado MERCADO).

**Apresentar carta de apresentação.**

Nosso objetivo é capturar uma ampla gama de pontos de vista que podem informar de forma útil as atividades da Land O'Lakes em Moçambique. Nós iremos falar com todos os processadores envolvidos com o projecto MERCADO. As suas respostas serão mantidas em sigilo e não serão usadas para nenhum outro propósito que um relatório que ajudará a informar o projeto de leites que está sendo implementado pela Land O'Lakes.

A entrevista deve durar cerca de uma hora. A participação é voluntária e você pode optar por não participar. Você também pode optar por recusar-se a responder a quaisquer perguntas com as quais não se sentir à vontade ou que não queira responder. Land O'Lakes gostaria que você se sentisse livre para ser aberto e honesto em suas respostas. Conhecer a verdadeira situação em suas atividades de produção de leite ajudará a fornecer um suporte melhor para você no futuro. Não há penalidades para você por não participar ou não responder a uma pergunta. Nem sua participação nem suas respostas afetarão sua capacidade de receber assistência da Land O'Lakes agora ou no futuro.

**Permission Question: Pergunta de permissão**

*Before we begin, do you have any questions about the purpose of the evaluation or what will happen to the information? If it's ok, I would like to audio record the interview for note-taking accuracy. The only people who will have access to the recordings and interview notes are project researchers, who have taken a strict oath of confidentiality. Antes de começar, tem alguma dúvida sobre o propósito da avaliação ou o que acontecerá com a informação? Se estiver tudo bem, gostaria de gravá-la em áudio para precisão na anotação. As únicas pessoas que terão acesso às gravações e as notas de entrevista são os pesquisadores do projeto, que fizeram um estrito juramento de confidencialidade*

Do I have your permission to conduct this interview?

Tenho sua permissão para fazer esta entrevista?

1 Yes *Sim*

2 No *Não*

☐

\*Select only one option **Selecione**

|                                                                                                                                                                                                                                                                                                                         |                                     |                          |                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                         |                                     |                          | apenas uma opção                                      |
|  If the respondent says NO, thank him/her, terminate the survey and proceed to the next respondent on your list. <b>Se o entrevistado disser Não, agradeça, termine o questionário e prossiga para o próximo entrevistado da lista</b> |                                     |                          |                                                       |
| Do I have your permission to record this interview? <i>Eu tenho a sua permissão para gravar esta entrevista?</i>                                                                                                                                                                                                        | 1 Yes <i>Sim</i><br>2 No <i>Não</i> | <input type="checkbox"/> | *Select only one option<br>Selecione apenas uma opção |
|  If the respondent says NO, turn off the tape recorder and do not record interview. <b>Se o entrevistado disser Não, desligue o gravador e não grave a entrevista.</b>                                                                 |                                     |                          |                                                       |

## SECTION 0: BACKGROUND ON BUSINESS AND ENGAGEMENT WITH MERCADO HISTÓRICO DO NEGÓCIO E ENVOLVIMENTO COM O MERCADO

**[Transition]: Enumerator: First, we would like to talk to you about your business and your engagement with the MERCADO project** *Inquiridor: Primeiro, gostaríamos de conversar sobre o seu negócio e seu engajamento com o projeto MERCADO*

|          |                                                                                                                                                                                                                                                                                                                                                                                             |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pr_back1 | Please provide a brief background on the cooperative/milk collection center (Processor)<br><b>Por favor, faça um breve histórico sobre a empresa</b><br><i>*Please describe (open-ended) Por favor, descreva abertamente</i> <ul style="list-style-type: none"> <li>Year of inception _____ <b>Ano de criação</b></li> <li>Motivation for start-up <b>Motivação para iniciar</b></li> </ul> |
| pr_back2 | When and how did you begin work with MERCADO project? <b>Quando e como começou a trabalhar com o projecto MERCADO?</b><br><i>*Please describe (open-ended) Por favor, descreva abertamente</i>                                                                                                                                                                                              |





|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                  |                                                                                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | -99 Do not know/refuse to answer →pr_record Não sabe / recusa-se a responder                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                  |                                                                                                                                                                                                                   |
| pr_train2 | <p>From whom did your busniess receive this training in the last 12 months (July 1, 2018 – June 30 2019)? De quem recebeu este treinamento nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</p> <ol style="list-style-type: none"> <li>Government agencies (national, state, local) →pr_record <b>Órgãos de Governo (nacionais, estatais, locais)</b></li> <li>Non-governmental organizations →pr_record <b>Organizações não governamentais</b></li> <li>Land O’ Lakes <b>Land O’ Lakes</b></li> <li>Other private companies →pr_record <b>Outras empresas privadas</b></li> <li>Input suppliers →pr_record <b>fornecedores de insumos</b></li> <li>Business development service providers →pr_record <b>provedores de serviços de desenvolvimento de negócios</b></li> <li>Own staff →pr_record <b>trabalhadores próprios</b></li> <li>Other, specify _____ →pr_record <b>Outros, especifique</b></li> </ol> <p>-99 Do not know/refuse to answer →pr_record Não sabe / recusa-se a responder</p> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply <b>Selecione tudo que se aplica</b></p> <p>*Ensure that if “-99” is chosen, no other option is chosen <b>Assegure-se que se “99” for escolhido, nenhuma outra opção é escolhida</b></p> |
| pr_train3 | <p>Thinking specifically about the training you’ve participated in from Land O’Lakes in the last 2 years, what were the training topics? what were your key learnings? Is there anything that you especially liked about this training? Are there any areas where you need more support? ? <b>Pensando especificamente no treinamento que você participou na Land O’Lakes nos últimos 2 anos, quais foram os tópicos dos treinamentos? Quais foram as principais coisas que aprendeu? Existe alguma coisa que você gostou especialmente deste treinamento? Existem áreas onde você precisa de mais suporte?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva abertamente</i></p>                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                  |                                                                                                                                                                                                                   |

## SECTION 1: RECORD KEEPING **REGISTOS**

**[Transition]: Enumerator: Thank you! Now we want to ask you about the records you keep for your business** **Inquiridor: Obrigado! Agora queremos perguntar sobre os registros que faz no seu negócio**

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                         |                                                                                                                                                                                                                                                                           |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pr_record  | <p>Did your business keep any kinds of records or logs in the last 12 months (July 1, 2018 – June 30, 2019)? <i>A sua empresa manteve algum tipo de registo para o seu negócio nos últimos 12 meses (de 1 de julho de 2018 a 30 de junho de 2019)?</i></p> <p>1 Yes → pr_record2 <i>Sim</i><br/> 2 No <i>Não</i><br/> -99 Do not know/refuse <i>Não sabe/recusa-se a responder</i></p>                                                                                                                                                                                                                                                                                 | _                                                                       | <p>*Select only one option<br/> <i>Selecione apenas uma opção</i></p>                                                                                                                                                                                                     |
| pr_record1 | <p>Why do you not keep any kinds of records or logs for your business? <i>Porquê não faz nenhum tipo de registo para o seu negócio?</i><br/> <i>*Please describe (open-ended) Por favor, descreva abertamente</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                         |                                                                                                                                                                                                                                                                           |
| pr_record2 | <p>What types of records did you keep in the last 12 months (July 1, 2018 – June 30, 2019)? <i>Que tipos de registos manteve nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</i></p> <p>1 Income and expense ledger <i>receita e despesa</i><br/> 2 Production ledgers (tracks inputs vs outputs) <i>Registos de Produção (rastreamento de entradas vs saídas)</i><br/> 3 Labor <i>trabalhadores</i><br/> 4 Equipment <i>equipamentos</i><br/> 5 Long range budgeting <i>orçamento de longo prazo</i><br/> 6 rejections of incoming milk <i>rejeições de leite recebido</i><br/> 7 Rejections of outgoing milk <i>rejeições de leite entregue</i></p> | _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ <br> _ | <p>*Ask if pr_record = 1<br/> *Select all that apply<br/> <i>Selecione tudo que se aplica</i><br/> *Prompt with options<br/> *Ensure that if “-99” is chosen, no other option is chosen <i>Assegure-se que se “99” for escolhido, nenhuma outra opção é escolhida</i></p> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>8 Monthly cash flow statement →<br/>pr_cash2 relatório mensal do<br/>fluxo de caixa</p> <p>9 Milk collection from suppliers<br/>leite recebido de fornecedores</p> <p>10 Milk sales vendas de leite</p> <p>11 Other, specify</p> <p>_____</p> <p>_ Outros, especifique</p> <p>-99 Do not know/refuse to answer<br/>Não sabe / recusa-se a responder</p>                                          |      |                                                                                                    |
| pr_record3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>*Ask if pr_train1 = 6</p> <p>Did you start or change the way you keep records as a result of any training you received? If so, what training? How did it change? <b>Começou ou mudou a forma de fazer registos como resultado de algum treinamento que recebeu? Se sim, qual treinamento? Como foi que mudou?</b></p> <p><i>Please describe (open-ended) Por favor, descreva abertamente</i></p> |      |                                                                                                    |
| <p><i>[Transition]: Enumerator: We want to really understand the revenues and costs of your business to understand how your business is doing. In order to do this, we need to ask you specific questions about your costs and revenues over the last year. If you have a monthly cash flow statement from last year (July 1, 2018 – June 30, 2019), it would be helpful if you get out the copy of your monthly cash flow statement so that we can talk about exact values. If not, then please try to provide accurate values.</i></p> <p><i>Inquiridor: Nós gostaríamos de compreender melhor as receitas e as despesas da sua empresa para entender como está a correr o negócio. Para isto, nós precisamos de perguntar questões específicas os seus custos e receitas do último ano. Se tiver um relatório mensal do fluxo de caixa do último ano (1 de Julho de 2018 a 30 de Junho 2019) seria uma ajuda se nos mostrasse uma cópia para termos os valores exactos. Se não, então por favor diga-nos os valores acurados.</i></p> |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                                                                    |
| pr_cash2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Is it possible to provide a copy of the monthly cash flow statement from last year (July 1, 2018 – June 30, 2019)? <b>É possível fornecer uma cópia relatório do fluxo de caixa do último ano (1 de julho de 2018 a 30 de junho de 2019)?</b></p> <p>1 Yes <b>Sim</b></p> <p>2 No <b>Não</b></p> <p>-99 Do not know/refuse to answer<br/><b>Não sabe / recusa-se a responder</b></p>             | I__I | <p>*Ask if pr_record2 = 8</p> <p>*Select only one option<br/><b>Selecione apenas uma opção</b></p> |

*[Enumerator Instruction]: If “pr\_cash2 = 1” then fill the following questions using the monthly cash flow statement, else ask the respondent and fill out:*

|                      |                                                                                                                                                                                                                                                                                                |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pr_othercost_record1 | Does the cash flow statement have information on cost of utilities? ? O<br>relatório de fluxo de caixa tem<br>informação dos custos dos serviços<br>públicos<br>1 Yes Sim<br>2 No Não<br>-99 Do not know/refuse to answer<br>Não sabe / recusa-se a responder                                  | I__I  | *Ask if pr_record2 = 8<br>*Select only one option<br>Selecione apenas uma opção                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| pr_othercost1        | What was the average monthly cost of utilities for your business over the last 12 months (July 1, 2018 – June 30, 2019)?<br>Qual foi o custo médio mensal de serviços públicos para o seu negócio nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?                             | _____ | *If pr_othercost_record1 = 1 then fill from record book, else ask respondent and fill out Preencha na base no livro de registos, se não pergunte ao entrevistado<br>*Ensure average monthly price in last 12 months is quoted Garantir que o preço médio mensal nos últimos 12 meses seja registado<br>*Explain that utilities include costs for fuel, electricity and water Explique que os serviços públicos incluem custos de combustível, eletricidade e água<br>*Enter -99 if don't know/refuse Digite -99 se não sabe /se recusa<br>*Enter 0 if this expense was not incurred Insira 0 se estas despesas não foram feitas<br>*Enter in Metical Insira em meticais |
| pr_othercost_record2 | Does the cash flow statement have information on rental costs of land/buildings/machinery? O relatório de fluxo de caixa tem informações do custo do aluguer de terrenos/ edifícios/ maquinaria?<br>1 Yes sim<br>2 No não<br>-99 Do not know/refuse to answer Não sabe / se recusa a responder | I__I  | *Ask if pr_record2 = 8<br>*Select only one option<br>selecione apenas uma opção                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| pr_othercost2        | What was the total rental cost of lands and buildings in the last 12 months (July                                                                                                                                                                                                              | _____ | *If pr_othercost_record2 = 1 then fill from record book,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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|                      | 1, 2018 – June 30, 2019)? Qual foi o custo total de aluguer de terrenos e edifícios nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?                                                                                                                                                                                                |       | <p>else ask respondent and fill out</p> <p>Preencha na base no livro de registos, se não, pergunte ao entrevistado</p> <p>*Ensure total cost in last 12 months is quoted <b>Garantir que o custo total nos últimos 12 meses seja registado</b></p> <p>*Enter -99 if don't know/refuse <b>Digite -99 se não sabe /se- recusa</b></p> <p>*Enter 0 if this expense was not incurred <b>Insira 0 se esta despesa não foi feita</b></p> <p>*Enter in Metical <b>Insira em meticais</b></p>                                                                                                                                                                                           |
| pr_othercost3        | <p>What was the total rental cost of machinery, vehicles and equipment (including storage equipment) in the last 12 months (July 1, 2018 – June 30, 2019)?</p> <p>Qual foi o custo total de alugar máquinas, veículos e equipamentos (incluindo equipamentos de armazenamento) nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</p> | _____ | <p>*If pr_othercost_record2 = 1 then fill from record book, else ask respondent and fill out</p> <p>Preencha na base no livro de registos, se não, pergunte ao entrevistado</p> <p>*Ensure total cost in last 12 months is quoted <b>Garantir que o custo total nos últimos 12 meses seja cotado</b></p> <p>*Enter -99 if don't know/refuse <b>Digite -99 se não sabe /se- recusa</b></p> <p>*Enter 0 if this expense was not incurred <b>Insira 0 se esta despesa não foi feita</b></p> <p>*Enter in Metical <b>Insira em meticais</b></p> <p>*Explain: this could include milk testing equipment <b>Explique que estes podem incluir equipamento de testagem de leite</b></p> |
| pr_othercost_record3 | <p>Does the cash flow statement have information on maintenance and repair costs? <b>O relatório do fluxo de caixa tem informação sobre os custos de manutenção e reparação?</b></p> <p>1 Yes <b>sim</b></p> <p>2 No <b>não</b></p>                                                                                                                 | I__I  | <p>*Ask if pr_record2 = 8</p> <p>*Select only one option <b>selecione apenas uma opção</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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|                      | -99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                      |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| pr_othercost4        | What was the total cost of maintenance and repair in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Qual foi o custo total de manutenção e reparação nos últimos 12 meses (1 de julho de 2018 - 30 de junho, 2019)?</b>                                                                                                                                | _____ | <p>*If pr_othercost_record3 = 1 then fill from record book, else ask respondent and fill out</p> <p>Preencha na base no livro de registos, se não, pergunte ao entrevistado</p> <p>*Ensure total cost in last 12 months is quoted <b>Garantir que o custo total nos últimos 12 meses seja cotado</b></p> <p>*Enter -99 if don't know/refuse <b>Digite -99 se não sabe /se- recusa</b></p> <p>*Enter 0 if this expense was not incurred <b>Insira 0 se esta despesa não foi feita</b></p> <p>*Enter in Metical <b>Insira em meticais</b></p> |
| pr_othercost_record4 | Does the cash flow statement have information on cost of consumables (e.g. milk utensils)? <b>O relatório do fluxo de caixa tem informação sobre os custos de consumíveis (ex. utensílios para leite)?</b><br>1 Yes <b>Sim</b><br>2 No <b>Não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                 | I__I  | <p>*Ask if pr_record2 = 8</p> <p>*Select only one option <b>selecione apenas uma opção</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| pr_othercost5        | What was the total cost of consumables (e.g. milk utensils), including office consumables and other consumables, in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Qual foi o custo total de consumíveis (ex. utensílios para leite), incluindo consumíveis de escritório e outros, nos últimos 12 meses (1 de julho de 2018 - 30 de junho, 2019)?</b> | _____ | <p>*If pr_othercost_record4 = 1 then fill from record book, else ask respondent and fill out</p> <p>Preencha na base no livro de registos, se não, pergunte ao entrevistado</p> <p>*Ensure total cost in last 12 months is quoted <b>Garantir que o custo total nos últimos 12 meses seja cotado</b></p> <p>*Enter -99 if don't know/refuse <b>Digite -99 se não sabe /se- recusa</b></p> <p>*Enter 0 if this expense was not incurred <b>Insira 0 se esta despesa não foi feita</b></p>                                                    |

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|                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                 |       | <p>*Enter in Metical <i>Insira em meticais</i></p> <p>*Explain: this could include costs for milk utensils</p> <p><i>Explique que deve incluir os custos dos utensílios de leite</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| pr_othercost_record5                                                                                                                                                                      | <p>Does the cash flow statement have information on cost of services to milk suppliers? <i>O relatório do fluxo de caixa tem informação sobre os custos de serviços prestados aos fornecedores de leite?</i></p> <p>1 Yes <i>Sim</i></p> <p>2 No <i>Não</i></p> <p>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i></p> | I__I  | <p>*Ask if pr_record2 = 8</p> <p>*Select only one option</p> <p><i>selecione apenas uma opção</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| pr_othercost6                                                                                                                                                                             | <p>What was the total cost of all services to milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)? <i>Qual foi o custo total de todos os serviços prestados aos fornecedores de leite nos últimos 12 meses (1 de julho de 2018 - 30 de junho, 2019)?</i></p>                                                                    | _____ | <p>*If pr_othercost_record5 = 1 then fill from record book, else ask respondent and then fill out</p> <p><i>Preencha na base no livro de registos, se não, pergunte ao entrevistado</i></p> <p>*Enter in Metical <i>Insira em meticais</i></p> <p>*Enter 0 if there was no cost <i>Insira 0 se não houve custos</i></p> <p>*Enter -99 if do not know/refuse to answer <i>Digite -99 se não sabe /se- recusa</i></p> <p>*If there have records for this, then ask them to show their records and fill out from record, else ask the question <i>Se houver registos disto, peça para mostrar e preencha com base nestes</i></p> |
| pr_othercost_record6                                                                                                                                                                      | <p>Does the cash flow statement have information on transportation costs? <i>O relatório do fluxo de caixa tem informação sobre o custo de transporte?</i></p> <p>1 Yes <i>sim</i></p> <p>2 No <i>não</i></p> <p>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i></p>                                                   | I__I  | <p>*Ask if pr_record2 = 8</p> <p>*Select only one option</p> <p><i>selecione apenas uma opção</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><i>[Enumerator Instruction] : If pr_othercost_record6 = 1, then for questions pr_othercost7 – pr_othercost8, fill from the record book ; else ask respondent and then fill out</i></p> |                                                                                                                                                                                                                                                                                                                                                 |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                                                                                                                                                                                     |
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| pr_othercost7       | What is the average monthly cost of transportation for your business in the last dry season (May through October 2018)? <i>Qual é o custo médio mensal de transporte no seu negócio na última época seca (Maio a Outubro de 2018)?</i>                                                                                                                                                                                                                                      | _____ | *Enter in Metical Metical<br><i>Insira em meticais</i><br>*Enter -99 if do not know/refuse to answer and "0" if no costs incurred <i>Digite -99 se não sabe /se recusa e Insira 0 se esta despesa não foi feita</i> |
| pr_othercost8       | What is the average monthly cost of transportation for your business in the last rainy season (November 2018 through April 2019)? <i>Qual é o custo médio mensal de transporte no seu negócio na última época chuvosa (Novembro de 2018 a Abril de 2019)?</i>                                                                                                                                                                                                               | _____ | *Enter in Metical Metical<br><i>Insira em meticais</i><br>*Enter -99 if do not know/refuse to answer and "0" if no costs incurred <i>Digite -99 se não sabe /se recusa e Insira 0 se esta despesa não foi feita</i> |
| pr_othercost9<br>_1 | Other than staff costs and milk purchase costs, that we will touch on later, what other costs of production in the last 12 months have we not included in the previous questions? <i>Sem contar com os custos do pessoal e da compra do leite, que serão abordados mais tarde, quais foram os outros custos de produção nos últimos 12 meses, que não foram incluídos nas perguntas anteriores?</i><br><i>*Please describe (open-ended) Por favor, descreva abertamente</i> |       |                                                                                                                                                                                                                     |
| pr_othercost9<br>_2 | Does the cash flow statement have information on these other costs? <i>O relatório do fluxo de caixa tem informação desses outros custos?</i><br>1 Yes <i>sim</i><br>2 No <i>não</i><br>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i>                                                                                                                                                                                                            | I__I  | *Ask if pr_record2 = 8<br>*Select only one option<br><i>selecione apenas uma opção</i>                                                                                                                              |
| pr_othercost9<br>_3 | Which other costs does the cash flow have information about? <i>Que outros custos o relatório do fluxo de caixa tem?</i><br><i>*Please describe (open-ended) Por favor, descreva abertamente</i>                                                                                                                                                                                                                                                                            |       |                                                                                                                                                                                                                     |

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|                 |                                                                                                                                                                                                                                                                            |       |                                                                                                                                    |
| pr_othercost9_4 | What were the other total costs of production that we have not included in the last 12 months (July 1, 2018 – June 30, 2018)? )? <b>Quais foram os outros custos totais de produção que não incluímos nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b> | _____ | *Enter in Metical <b>Insira em meticais</b><br>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b> |

## SECTION 2: PROCUMENT, PROCESSING, AND SALES **COMPRAS, PROCESSAMENTO E VENDAS**

**[Transition]: Enumerator: Thank you! Now we want to talk to you about your procurement, processing, and sales of milk and milk products** **Inquiridor: Obrigado! Agora gostaríamos de falar acerca das compras, processamento e vendas de leite e laticínios**

**[Transition]: Enumerator: First, let's talk about your procurement of milk and milk products** **Primeiro, vamos falar de compras e processamento de leite e seus derivados**

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                              |                                             |                                      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| pr_procure_0       | Did you procure any milk in the past 12 months (July 31, 2018 to June 30, 2019)?<br><b>Comprou algum leite nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No → thank respondent and end the interview <b>Não – agradeça ao entrevistado e termine a entrevista</b><br>-99 Do not know/refuse to answer → thank respondent and end the interview <b>Não sabe / se recusa a responder - agradeça ao entrevistado e termine a entrevista</b> |                                                              |                                             |                                      | I__I | *Select only one option<br><b>selecione apenas uma opção</b>                                                                                                                                                                                                                                                                                                                                                                        |
| pr_procure_record1 | Does the record book have information on procurement of milk? <b>O vosso livro de registos, tem informação sobre as compras de leite?</b><br>1 Yes <b>sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                             |                                                              |                                             |                                      | I__I | *Ask if pr_record = 1<br>*Select only one option<br><b>selecione apenas uma opção</b>                                                                                                                                                                                                                                                                                                                                               |
| pr_procure_1       | How much of the following types of milk did you procure in the last dry season (May through October 2018) comes from? <b>Quanto, de cada tipo de leite seguinte, comprou na última época seca (Maio a Outubro de 2018)?</b>                                                                                                                                                                                                                                                              |                                                              |                                             |                                      |      | *If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha com base no livro de registos, se não, pergunte ao entrevistado<br>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b><br>*If milk then enter quantity in liters and price/liter <b>Se leite cru, insira a quantidade em litros e o preço/litro</b><br>*If imported powder, then enter quantity in |
|                    | Supplier Type<br><b>Tipo de leite</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Qty procured (liters)<br><b>Quantidade comprada (litros)</b> | # of suppliers<br><b>Nº de fornecedores</b> | Price /unit<br><b>Preço unitário</b> |      |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                    | Imported powder <b>leite em Pó importado</b>                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                              |                                             |                                      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|              |                                                                                                                                                                                                |  |  |  |       |                                                                                                                                                                                                                                                                                                      |
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|              | Raw milk from smallholder farmers Leite cru de pequenos produtores                                                                                                                             |  |  |  |       | kilograms and price/kilogram Se leite em pó importado, insira a quantidade em kilogramas e o preço por kilograma                                                                                                                                                                                     |
|              | Raw milk from commercial farmers leite cru de produtores comerciais                                                                                                                            |  |  |  |       |                                                                                                                                                                                                                                                                                                      |
|              | Raw milk from businesss Leite cru de negócios                                                                                                                                                  |  |  |  |       |                                                                                                                                                                                                                                                                                                      |
|              | Other, specify Outro, especifique                                                                                                                                                              |  |  |  |       |                                                                                                                                                                                                                                                                                                      |
| pr_procure_2 | What volume of milk has the business procured in the last dry season (May through October 2018)? Qual foi o volume de leite que o seu comprou na última época seca (Maio a Outubro de 2018)?   |  |  |  | _____ | <p>*If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha com base no livro de registos, se não, pergunte ao entrevistado</p> <p>*Enter in liters Insira em litros</p> <p>*Enter -99 if do not know/refuse to answer Digite -99 se não sabe /se recusa</p> |
| pr_procure_3 | What was the average price paid to your suppliers during the dry season (May through October 2018)? Qual foi o preço médio pago aos seus fornecedores, na época seca (Maio a Outubro de 2018)? |  |  |  | _____ | <p>*If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha com base no livro de registos, se não, pergunte ao entrevistado</p> <p>*Enter in Metical Insira em meticais</p> <p>*Enter -99 if do not know/refuse to answer</p>                                |

|              |                                                                                                                                                                                                                                               |                                                              |                                             |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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|              |                                                                                                                                                                                                                                               |                                                              |                                             |                                      | Digite -99 se não sabe /se recusa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| pr_procure_4 | What is the total value of milk procured by the business in the last dry season (May through October 2018)? <b>Qual foi o valor total do leite comprador na última época seca (Maio a Outubro de 2018)?</b>                                   |                                                              |                                             |                                      | *If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha com base no livro de registros, se não, pergunte ao entrevistado<br>*Use calculator to ensure the total value is the product of use a calculadora para assegurar que o valor é o produto de pr_procure_2 and pr_procure_3<br>*Enter in Metical <b>Insira em meticais</b><br>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b>                                                                                         |
| pr_procure_5 | How much of the following types of milk did you procure in the last rainy season (November 2018 to April 2019) comes from? <b>Quanto, de cada tipo de leite seguinte, comprou na última época chuvosa (Novembro de 2018 a Abril de 2019)?</b> |                                                              |                                             |                                      | *If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out Preencha com base no livro de registros, se não, pergunte ao entrevistado<br>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b><br>*If milk then enter quantity in liters and price/liter <b>Se leite, insira a quantidade em litros e o preço/litro</b><br>*If imported powder, then enter quantity in kilograms and price/kilogram <b>Se leite em pó importado, insira a quantidade em kilogramas e o preço por kilograma</b> |
|              | Supplier Type<br><b>Tipo de leite</b>                                                                                                                                                                                                         | Qty procured (liters)<br><b>Quantidade comprada (litros)</b> | # of suppliers<br><b>Nº de fornecedores</b> | Price /unit<br><b>Preço unitário</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|              | Imported powder <b>leite em Pó importado</b>                                                                                                                                                                                                  |                                                              |                                             |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|              | Raw milk from smallholder farmers <b>Leite cru de pequenos produtores</b>                                                                                                                                                                     |                                                              |                                             |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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|              | Raw milk from cooperatives<br>Leite cru de cooperativas                                                                                                                                                                    |  |  |  |       |                                                                                                                                                                                                                                                                             |
|              | Raw milk from commercial suppliers<br>leite cru de produtores comerciais                                                                                                                                                   |  |  |  |       |                                                                                                                                                                                                                                                                             |
|              | Other, specify<br>Outro, especifique                                                                                                                                                                                       |  |  |  |       |                                                                                                                                                                                                                                                                             |
| pr_procure_6 | What volume of milk has the business procured in the last rainy season (November 2018 through April 2019)? Qual foi o volume de leite que comprou, na última época chuvosa (Novembro 2018 a Abril de 2019)?                |  |  |  | _____ | *If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter in liters Insira em litros<br>*Enter -99 if do not know/refuse to answer                                                                                                  |
| pr_procure_7 | What was the average price paid to your suppliers during the rainy season (November 2018 through April 2019)? Qual foi o preço médio pago aos fornecedores durante a última época chuvosa (Novembro 2018 a Abril de 2019)? |  |  |  | _____ | *If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter in Metical Insira em meticais<br>*Enter -99 if do not know/refuse to answer                                                                                               |
| pr_procure_8 | What is the total value of milk procured by the business in the last rainy season (November 2018 through April 2019)? Qual foi o valor total do leite comprado na última época chuvosa (Novembro de 2018 a Abril de 2019)? |  |  |  | _____ | *If pr_procure_record1 = 1 then fill from record book, else ask respondent and fill out<br>* Use calculator to ensure the total value is the product of pr_procure_6 and pr_procure_7<br>*Enter in Metical Insira em meticais<br>*Enter -99 if do not know/refuse to answer |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                          |                                                                                                |
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| pr_procure_9  | <p>What type of milk supply/supplier do you prefer? Why? <b>Que tipo de leite fornecido/fornecedor é da sua preferência? Porquê?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva abertamente</i></p>                                                                                                                                                                                                                                              |                          |                                                                                                |
| pr_procure_10 | <p>What are the pros and cons of different types of milk suppliers? <b>Quais são os prós e contras dos diferentes tipos de fornecedores de leite?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva abertamente</i></p> <p><i>*Ask about price and quality Pergunte sobre preços e quantidades</i></p>                                                                                                                                              |                          |                                                                                                |
| pr_procure_11 | <p>Did the business have any formal agreement with any of your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A empresa tem algum contrato formal com qualquer um dos seus fornecedores de leite nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p> <p>1 Yes <b>Sim</b></p> <p>2 No → pr_procure_13 <b>Não</b></p> <p>-99 Do not know/refuse to answer → pr_procure_13 <b>Não sabe / se recusa a responder</b></p> | <input type="checkbox"/> | <p><i>*Select only one option<br/>selecione apenas uma opção</i></p>                           |
| pr_procure_12 | <p>How many agreements did you have with your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantos contratos teve com os seus fornecedores de leite nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p>                                                                                                                                                                                                           | <input type="text"/>     | <p><i>*Enter -99 if do not know/refuse to answer<br/>Digite -99 se não sabe /se recusa</i></p> |

|               |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                              |                                                                                                                                                                                                                                                                  |
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| pr_procure_13 | <p>Did you provide any support services to your milk suppliers in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Prestou algum serviço de apoio aos seus fornecedores de leite nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p> <p>1 Yes <b>Sim</b><br/> 2 No → pr_procure_15 <b>Não</b><br/> -99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p> | <input type="checkbox"/>                                                                                     | <p>*Select only one option <b>selecione apenas uma opção</b><br/> *Explain: Services could include training, technical support, transport services etc. <b>Explique que Serviços podem incluir treinamento, suporte técnico, serviços de transporte, etc</b></p> |
| pr_procure_14 | <p>Can you explain the types of support services you offered? <b>Pode explicar os tipos de serviços de apoio prestou?</b><br/> <i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                                   |                                                                                                              |                                                                                                                                                                                                                                                                  |
| pr_procure_15 | <p>Why did you not provide any support services? <b>Porque razão não presta serviços de apoio?</b><br/> <i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                                                          |                                                                                                              |                                                                                                                                                                                                                                                                  |
| pr_procure_16 | <p>How is the milk transported from your suppliers? <b>Como o leite dos seus fornecedores é transportado?</b></p> <p>1 Suppliers come to our doorstep <b>fornecedores vêm à nossa porta</b></p>                                                                                                                                                                                                           | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply <b>Selecione tudo que se aplica</b><br/> *Ensure that if “-99” is chosen, no other option is chosen</p>                                                                                                                                |



|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                          |
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|               | <p>2 Business travels to buy milk from seller <b>A empresa faz viagens para comprar leite do fornecedor</b></p> <p>3 Other, specify <b>Outro, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                                                                         |  | <p><b>Assegure-se que se 99 foi escolhido, nenhuma outra opção pode ser incluída</b></p> |
| pr_procure_17 | <p>What challenges, if any, does the business face in milk procurement? <b>Quais os desafios, se houver, o vosso negócio enfrenta na compra do leite?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                                                                                                                                 |  |                                                                                          |
| pr_procure_18 | <p><b>*If no challenges described in pr_procure_17, skip question</b></p> <p>How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address any procurement challenges? <b>Como é que o vosso negócio tentou resolver esses desafios? O que funcionou e o que não resultou? O projeto MERCADO ajudou de alguma forma a resolver os desafios de aquisição do leite?</b></p> <p><i>*Please describe (open-ended) Por favor, descreva (abertamente)</i></p> |  |                                                                                          |
| pr_procure_19 | <p><b>*If no challenges described in pr_procure_17, skip question</b></p> <p>What does the business think will be necessary to successfully tackle challenges related to milk procurement? (*If no challenges, skip question) <b>O que é que a empresa julga que será necessário para enfrentar com sucesso esses desafios da compra do leite? (Se não houver desafios, passe esta questão)</b></p> <p><i>*Please describe (open-ended) Por favor, descreva (em aberto)</i></p>                                                           |  |                                                                                          |

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|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                                       |
| pr_procure_20 | <p>Have you seen any changes in milk procurement since participation in the MERCADO project, if at all? <b>Tem visto alguma mudança na compra de leite desde a sua participação no projecto MERCADO?</b></p> <p>1 Increased <b>Aumentou</b><br/> 2 Decreased <b>Diminuiu</b><br/> 3 Stayed the same <b>Ficou na mesma</b><br/> -99 Do not know/refuse to answer → pr_procure_22 <b>Não sabe / se recusa a responder</b></p>                         | I__I  | <p>*Select one option<br/> <b>selecione apenas uma opção</b></p>      |
| pr_procure_21 | <p>Why do you think milk procurement changed because of the MERCADO project? <b>Porquê julga que a compra de leite mudou devido ao projecto MERCADO?</b><br/> <i>*Please describe (open ended) Por favor, descreva (em aberto)</i></p>                                                                                                                                                                                                              |       |                                                                       |
| pr_procure_22 | <p>How was the volume of milk procured from your suppliers impacted by Cyclone Idai, if at all? <b>Como foi que o volume de leite adquirido dos fornecedores foi afetado pelo ciclone Idai?</b></p> <p>1 Increased → pr_procure_24 <b> aumentou</b><br/> 2 Decreased <b>dominuiu</b><br/> 3 Stayed the same → pr_procure_24 <b>ficou na mesma</b><br/> -99 Do not know/refuse to answer → pr_procure_24 <b>Não sabe / se recusa a responder</b></p> | I__I  | <p>*Select only one option<br/> <b>selecione apenas uma opção</b></p> |
| pr_procure_23 | <p>How many liters per month did your procurement decrease as a result of Cyclone Idai? <b>Quantos litros de leite diminuiram por</b></p>                                                                                                                                                                                                                                                                                                           | _____ | <p>*Enter -99 if do not know/refuse to answer</p>                     |

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                                               |
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|                                                                                                                                                                  | mês, nas suas compras devido ao ciclone Idai?                                                                                                                                                                                                                                                                                                                                             |       | Digite -99 se não sabe /se recusa                                                             |
| pr_procure_24                                                                                                                                                    | <p>How was the price paid to your suppliers impacted by Cyclone Idai, if at all? Como alterou o preço do leite pago aos fornecedores devido ao cyclone Idai?</p> <p>1 Increased → pr_procure_26 aumentou</p> <p>2 Decreased diminuiu</p> <p>3 Stayed the same → pr_procure_27 ficou na mesma</p> <p>-99 Do not know/refuse to answer → pr_procure_27 Não sabe / se recusa a responder</p> | I__I  | *Selection only one option <b>selecione apenas uma opção</b>                                  |
| pr_procure_25                                                                                                                                                    | How many meticals/liter did the price paid to your suppliers decrease as a result of Cyclone Idai? <b>Quantos meticais por litro baixou no preço pago ao fornecedores, devido ao cyclone Idai?</b>                                                                                                                                                                                        | _____ | *Enter -99 if do not know/refuse to answer<br><b>Digite -99 se não sabe /se recusa</b>        |
| pr_procure_26                                                                                                                                                    | How many meticals/liter did the price paid to your suppliers increase as a result of Cyclone Idai? <b>Quantos meticais por litro aumentou no preço pago ao fornecedores, devido ao cyclone Idai?</b>                                                                                                                                                                                      | _____ | *Enter -99 if do not know/refuse to answer<br><b>Digite -99 se não sabe /se recusa</b>        |
| pr_procure_27                                                                                                                                                    | <p>What other challenges in milk procurement have you faced as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term? <b>Que outros desafios enfrentou na aquisição de leite como resultado do Cyclone Idai? Acha que os efeitos que acabou de mencionar são de curto ou longo-prazo?</b></p> <p><i>*Describe (open-ended)</i></p>       |       |                                                                                               |
| [Transition]: Enumerator: Now let's talk about your processing of milk and milk products <b>Agora vamos falar do seu processamento de leite e dos laticínios</b> |                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                                               |
| pr_process_record                                                                                                                                                | <p>Does the record book have information on milk processing? <b>O seu livro de registos tem informação do processamento de leite?</b></p> <p>1 Yes <b>Sim</b></p> <p>2 No <b>Não</b></p>                                                                                                                                                                                                  | I__I  | <p>*Ask if pr_record = 1</p> <p>*Select only one option <b>selecione apenas uma opção</b></p> |

|                |                                                                                                                                                                                                                                                                                                |       |                                                                                                                                                                                                                                                                 |
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|                | -99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                 |
| pr_process_1   | In the last dry season (May through October 2018) what volume of milk has the business processed? <b>Qual o volume de leite que processou na última época seca (Maio a Outubro de 2018)?</b>                                                                                                   | _____ | <p>*Ensure number is <math>\leq</math> pr_procure_2 <b>assegure-se que o número seja igual ou menor ao comprado</b></p> <p>*Enter in liters <b>Insira em litros</b></p> <p>*Enter -99 if do not know/refuse to answer</p>                                       |
| pr_process_2   | What is the total capacity in liters that you could process on a daily basis on average, in the last dry season (May through October 2018)? <b>Qual é a capacidade total, em litros, que poderia processor em média por dia, na última época seca (Maio a Outubro de 2018)?</b>                | _____ | <p>*Enter in liters <b>Insira em litros</b></p> <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p>                                                                                                                      |
| pr_process_2_1 | On average how many liters of processing capacity was utilized daily in the last dry season (May through October 2018)? <b>Em média, quantos litros da capacidade de processamento utilizou na última época seca (Maio a Outubro de 2018)?</b>                                                 | _____ | <p>*Enter in liters <b>Insira em litros</b></p> <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p>                                                                                                                      |
| pr_process_3   | In the last rainy season (November 2018 through April 2019) what volume of milk has the business processed? <b>Qual o volume de leite que processou na última época chuvosa (Novembro 2018 a Abril 2019)?</b>                                                                                  | _____ | <p>*Ensure number is <math>\leq</math> pr_procure_6 <b>Assegure que o número seja menor ou igual o procure 6</b></p> <p>*Enter in liters <b>Insira em litros</b></p> <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p> |
| pr_process_4   | What is the total capacity in liters that you can process on a daily basis on average, in the last rainy season (November 2018 through April 2019)? <b>Qual é a capacidade total, em litros, que poderia processor em média por dia, na última época chuvosa (Novembro 2018 a Abril 2019)?</b> | _____ | <p>*Enter in liters <b>Insira em litros</b></p> <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p>                                                                                                                      |
| pr_process_4_1 | On average how many liters of processing capacity was utilized daily in the last rainy season (November 2018 through April 2019)? <b>Em média, quantos litros da capacidade de processamento utilizou na última época chuvosa (Novembro 2018 a Abril 2019)?</b>                                | _____ | <p>*Enter in liters <b>Insira em litros</b></p> <p>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b></p>                                                                                                                      |

[Transition]: Enumerator: Great! Now, let's talk about your milk and milk product sales *Ótimo! Vamos então falar da venda de leite e dos produtos de laticínios*

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                   |                             |                                                                |                                                                                                                                                                                                                                                                                                                  |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pr_sales_1       | <p>Which of the following value-added activities does your business undertake? <i>Quais das seguintes actividades de valor-acrescentado o seu negócio faz?</i></p> <p>1 No value-added activities <i>Nenhuma actividade de valor-acrescentado</i></p> <p>2 Processing <i>Processamento</i></p> <p>3 Refrigeration/chilling <i>Refrigeramento</i></p> <p>4 Pasteurization <i>Pasteurização</i></p> <p>5 Storage <i>Armazenamento</i></p> <p>6 Homogenization <i>Homogenização</i></p> <p>7 Delivery to buyers <i>Entregas aos compradores</i></p> <p>8 Other, specify <i>Outros, especifique</i></p> <p>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i></p> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply<br/><i>Selecione todos que se aplicam</i></p> <p>*Ensure that if "0" or "-99" is chosen no other option is chosen<br/><i>Assegure-se que se "0" ou "99" forem escolhidos, nenhuma outra opção pode ser incluída</i></p> |                             |                                                                |                                                                                                                                                                                                                                                                                                                  |
| pr_sales_record1 | <p>Does the record book have information on milk and milk product sales? <i>O livro de registos tem informação sobre as vendas de leite e dos laticínios</i></p> <p>3 Yes <i>Sim</i></p> <p>4 No <i>Não</i></p> <p>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i></p>                                                                                                                                                                                                                                                                                                                                                                                     | <input type="checkbox"/>                                                                                                                                                                                                     | <p>*Select only one option<br/><i>selecione apenas uma opção</i></p>                                                                                                                                                                              |                             |                                                                |                                                                                                                                                                                                                                                                                                                  |
| pr_sales_2       | <p>In the last dry season (May through October 2018), what was the volume sold of each type of milk product (e.g. processed milk, yogurt, cheese, etc.) and the price/unit you receive? <i>Na última época seca (Maio a Outubro de 2018) qual foi o volume de vendas de cada um dos derivados de leite (p. ex. Leite processado, iogurte, queijo, etc.) e o preço/unidade que recebeu</i></p>                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                   |                             |                                                                | <p>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out</p> <p>*If sell more than 5 products, ask for 5 most important ones <i>Se vende mais de 5 produtos, pergunte pelos 5 mais importantes</i></p> <p>*Enter "0" if no sales<br/><i>Inserir "0" se não houver vendas</i></p> |
|                  | Product<br>Produto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Specify product<br>especifique o produto                                                                                                                                                                                     | Qty sold<br>Quantidade vendida                                                                                                                                                                                                                    | Price/unit<br>Preço/unidade | Unit (Select one)<br>Unidade (escolha uma)                     |                                                                                                                                                                                                                                                                                                                  |
|                  | Product 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                   |                             | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                                  |
|                  | Product 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                   |                             | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                                  |
|                  | Product 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                   |                             | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                                  |

|            |                                                                                                                                                                                                                                                                                                     |                                              |  |                                |                                                                |                                                                                                                                                                                                                                                                                                                                             |  |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--|--------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|            | Product 4                                                                                                                                                                                                                                                                                           |                                              |  |                                | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                                                             |  |
|            | Product 5                                                                                                                                                                                                                                                                                           |                                              |  |                                | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                                                             |  |
| pr_sales_3 | What types of buyers has the business sold to – what is the total value sold to each buyer in the last dry season (May through October 2018)? <b>Para que tipos de compradores vendeu? Qual foi o valor total vendido para cada comprador, na última época seca (Maio a Outubro de 2018)</b>        |                                              |  |                                |                                                                | *If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*If more than 5 buyer types, ask for 5 most important ones <b>Se são mais de 5 compradores, pergunte pelos 5 mais importantes</b><br>*Enter “0” if no sales <b>Inserir “0” se não houver vendas</b><br>*Enter in Metical <b>Insira em meticais</b> |  |
|            | Buyer                                                                                                                                                                                                                                                                                               | Specify buyer <b>especifique o comprador</b> |  | Total Value <b>Valor total</b> |                                                                |                                                                                                                                                                                                                                                                                                                                             |  |
|            | Buyer 1                                                                                                                                                                                                                                                                                             |                                              |  |                                |                                                                |                                                                                                                                                                                                                                                                                                                                             |  |
|            | Buyer 2                                                                                                                                                                                                                                                                                             |                                              |  |                                |                                                                |                                                                                                                                                                                                                                                                                                                                             |  |
|            | Buyer 3                                                                                                                                                                                                                                                                                             |                                              |  |                                |                                                                |                                                                                                                                                                                                                                                                                                                                             |  |
|            | Buyer 4                                                                                                                                                                                                                                                                                             |                                              |  |                                |                                                                |                                                                                                                                                                                                                                                                                                                                             |  |
|            | Buyer 5                                                                                                                                                                                                                                                                                             |                                              |  |                                |                                                                |                                                                                                                                                                                                                                                                                                                                             |  |
| pr_sales_4 | What was the business’s total value of sales of all milk products in the last dry season (May through October 2018)? <b>Qual foi o valor total das vendas do todos produtos de laticínios na última época seca (Maio a Outubro de 2018)</b>                                                         |                                              |  |                                | _____                                                          | *If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter in Metical <b>Insira em meticais</b><br>*Enter -99 if do not know/refuse to answer <b>Digite -99 se não sabe /se recusa</b><br>*Enter 0 if no sales <b>Inserir “0” se não houver vendas</b>                                                 |  |
| pr_sales_5 | What was the businesses’ total volume of sales in liters of milk products such as milk and yogurt in the last dry season (May through October 2018)? <b>Qual foi o volume total de litros vendidos de produtos de laticínios, como leite e iogurte, na última época seca (Maio a Outubro 2018)?</b> |                                              |  |                                | _____                                                          | *If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter in liters <b>Insira em litros</b><br>*Enter 0 if no sales<br>*Ask only about sales of products which are measured in liters like milk and yogurt <b>Pergunte apenas pelas vendas de produtos medidos em litros, como leite e iogurte</b>    |  |

|            |                                                                                                                                                                                                                                                                                                                                                                   |                                          |                                |                                 |                                                                |                                                                                                                                                                                                                                                                                                       |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------|---------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pr_sales_6 | What was the businesses' total volume of sales in kilograms of milk products such as cheese in the last dry season (May through October 2018)? <b>Qual foi o volume total de kilogramas vendidos de produtos de laticínios, como queijo, na última época seca (Maio a Outubro 2018)?</b>                                                                          |                                          |                                |                                 | _____                                                          | *If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*Enter in liters<br>*Enter 0 if no sales<br>*Ask only about sales of products which are measured in kilograms like cheese <b>Pergunte apenas pelas vendas de produtos medidos em kilogramas, como queijo</b> |
| pr_sales_7 | What is the volume sold of milk products (e.g. processed milk, yogurt, cheese, etc.) and the price/unit in the last rainy season (November 2018 through April 2019)? <b>Na última época chuvosa (Novembro 2018 a Abril 2019) qual foi o volume de vendas de cada um dos derivados de leite (p. ex. Leite processado, iogurte, queijo, etc.) e o preço/unidade</b> |                                          |                                |                                 |                                                                | *If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*If sell more than 5 products, ask for 5 most important ones<br>*Enter 0 if no sales                                                                                                                         |
|            | Product<br>Produto                                                                                                                                                                                                                                                                                                                                                | Specify product<br>especifique o produto | Qty sold<br>Quantidade vendida | Price/<br>unit<br>Preço/unidade | Unit<br>(Select one)<br>Unidade (escolha uma)                  |                                                                                                                                                                                                                                                                                                       |
|            | Product 1                                                                                                                                                                                                                                                                                                                                                         |                                          |                                |                                 | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                       |
|            | Product 2                                                                                                                                                                                                                                                                                                                                                         |                                          |                                |                                 | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                       |
|            | Product 3                                                                                                                                                                                                                                                                                                                                                         |                                          |                                |                                 | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                       |
|            | Product 4                                                                                                                                                                                                                                                                                                                                                         |                                          |                                |                                 | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                       |
|            | Product 5                                                                                                                                                                                                                                                                                                                                                         |                                          |                                |                                 | <input type="checkbox"/> Kg<br><input type="checkbox"/> Liters |                                                                                                                                                                                                                                                                                                       |
| pr_sales_8 | What types of buyers has the business sold to – what is the total value sold in the last rainy season (November 2018 through April 2019)? <b>Para que tipos de compradores vendeu? Qual foi o valor total vendido para cada comprador, na última época chuvosa (Novembro 2018 a Abril 2019)?</b>                                                                  |                                          |                                |                                 |                                                                | *If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out<br>*If more than 5 buyer types, ask for 5 most important ones<br>*Enter 0 if no sales<br>*Enter in Metical <b>Insira em meticais</b>                                                                            |
|            | Buyer                                                                                                                                                                                                                                                                                                                                                             | Specify buyer<br>especifique o comprador |                                | Total Value<br>Valor total      |                                                                |                                                                                                                                                                                                                                                                                                       |

|             |                                                                                                                                                                                                                                                                                                                                                                             |  |  |       |                                                                                                                                                                                                                                                      |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Buyer 1                                                                                                                                                                                                                                                                                                                                                                     |  |  |       |                                                                                                                                                                                                                                                      |
|             | Buyer 2                                                                                                                                                                                                                                                                                                                                                                     |  |  |       |                                                                                                                                                                                                                                                      |
|             | Buyer 3                                                                                                                                                                                                                                                                                                                                                                     |  |  |       |                                                                                                                                                                                                                                                      |
|             | Buyer 4                                                                                                                                                                                                                                                                                                                                                                     |  |  |       |                                                                                                                                                                                                                                                      |
|             | Buyer 5                                                                                                                                                                                                                                                                                                                                                                     |  |  |       |                                                                                                                                                                                                                                                      |
| pr_sales_9  | What was the businesses' total value of sales of milk products in the last rainy season (November 2018 through April 2019)? <b>Qual foi o valor total vendido de produtos de laticínios, na última época chuvosa (Novembro 2018 a Abril 2019)?</b>                                                                                                                          |  |  | _____ | <b>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out</b><br><b>*Enter in Metical Insira em meticais</b><br><b>*Enter -99 if do not know/refuse to answer</b><br><b>*Enter 0 if no sales</b>                      |
| pr_sales_10 | What was the businesses' total volume of sales in liters of milk products such as milk and yogurt in the last rainy season (November 2018 through April 2019)? <b>Qual foi o volume total de litros vendidos de produtos de laticínios, como leite e iogurte, na última época chuvosa (Novembro 2018 a Abril 2019)?</b>                                                     |  |  | _____ | <b>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out</b><br><b>*Enter in liters</b><br><b>*Enter 0 if no sales</b><br><b>*Ask only about sales of products which are measured in liters like milk and yogurt</b> |
| pr_sales_11 | What was the businesses' total volume of sales in kilograms of milk products such as cheese in the last rainy season (November 2018 through April 2019)? <b>Qual foi o volume total de kilogramas vendidos de produtos de laticínios, como queijo, na última época chuvosa (Novembro 2018 a Abril 2019)?</b>                                                                |  |  | _____ | <b>*If pr_sales_record1 = 1 then fill from record book, else ask respondent and fill out</b><br><b>*Enter in liters</b><br><b>*Enter 0 if no sales</b><br><b>*Ask only about sales of products which are measured in kilograms like cheese</b>       |
| pr_sales_12 | Did the business have any agreement with a buyer in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A empresa teve algum contrato com compradores nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Yes <b>Sim</b><br>2 No → pr_sales_14 <b>Não</b><br>-99 Do not know/refuse to answer → pr_sales_14 <b>Não sabe / se recusa a responder</b> |  |  | I__I  | <b>*Select only one option</b>                                                                                                                                                                                                                       |





|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                         |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------|
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                         |
| pr_sales_17   | <p><i>*If no challenges described in pr_sales_15, skip question</i></p> <p>What does the business think will be necessary to successfully tackle these challenges? <i>O que a empresa acha que será necessário para enfrentar com sucesso os estes desafios?</i></p> <p><i>*Please describe (open-ended) Por favor, descreva (abertamente)</i></p>                                                                                                      |      |                         |
| pr_sales_18   | <p>Have you seen any changes in milk /milk products sales since participation in the MERCADO project, if at all? <i>Tem notado mudanças na venda do leite e dos produtos de laticínios devido a vossa participação no projecto MERCADO?</i></p> <p>1 Increased <i> aumentou</i></p> <p>2 Decreased <i> Diminuiu</i></p> <p>3 Stayed the same <i> ficou na mesma</i></p> <p>-99 Do not know/refuse to answer <i>Não sabe / se recusa a responder</i></p> | I__I | *Select only one option |
| pr_sales_19a  | <p>How do you think milk sales changed because of the MERCADO project? <i>Porquê julga que as vendas de leite mudaram por causa do projeto MERCADO?</i></p> <p><i>*Please describe (open-ended) Por favor descreva abertamente</i></p>                                                                                                                                                                                                                  |      |                         |
| pr_sales_20_1 | <p>How was the volume of milk sales impacted by Cyclone Idai, if at all? <i>Como foi que o volume de leite foi afectado pelo ciclone Idai?</i></p> <p>1 Increased → pr_sales_21_1 <i> aumentou</i></p> <p>2 Decreased <i> diminuiu</i></p> <p>3 Stayed the same → pr_sales_21_1 <i> ficou na mesma</i></p>                                                                                                                                              | I__I | *Select only one option |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------|
|               | -99 Do not know/refuse to answer →<br>pr_sales_21_1 Não sabe / se recusa a responder                                                                                                                                                                                                                                                                                                                                                                                         |       |                                            |
| pr_sales_20_2 | How many liters per month did your sales decrease as a result of Cyclone Idai? <b>Quantos litros de vendas diminuiram por mês, devido ao ciclone Idai?</b>                                                                                                                                                                                                                                                                                                                   | _____ | *Enter -99 if do not know/refuse to answer |
| pr_sales_21_1 | How was the price received for your milk impacted by Cyclone Idai, if at all? <b>Como foi que o preço recebido pelo leite foi afectado pelo ciclone Idai?</b><br>1 Increased → pr_sales_22_1 <b> aumentou</b><br>2 Decreased <b>diminuiu</b><br>3 Stayed the same → pr_sales_22_1 <b>ficou na mesma</b><br>-99 Do not know/refuse to answer → pr_sales_22_1 <b>Não sabe / se recusa a responder</b>                                                                          | I__I  | *Select only one option                    |
| Sales_21_2    | By how many meticals/liter did the price received by you decrease as a result of Cyclone Idai? <b>Quantos meticais / litro, o preço recebido diminuiu, devido ao ciclone Idai?</b>                                                                                                                                                                                                                                                                                           | _____ | *Enter -99 if do not know/refuse to answer |
| pr_sales_22_1 | How was the volume of milk product (e.g. yogurt, cheese, etc.) sales impacted by Cyclone Idai, if at all? <b>Como foi o volume de vendas dos produtos de lacticínios (p.ex. iogurte, queijo, etc.) foi afectado pelo ciclone Idai?</b><br>1 Increased → pr_sales_23_1 <b> aumentou</b><br>2 Decreased <b>diminuiu</b><br>3 Stayed the same → pr_sales_23_1 <b>ficou na mesma</b><br>-99 Do not know/refuse to answer → pr_sales_23_1 <b>Não sabe / se recusa a responder</b> | I__I  | *Selection only one option                 |
| pr_sales_22_2 | How many kilograms per month did your sales decrease as a result of Cyclone Idai? <b>Quantos kilogramas por mês as suas vendas diminuiram como resultado do cyclone Idai?</b>                                                                                                                                                                                                                                                                                                | _____ | *Enter -99 if do not know/refuse to answer |
| pr_sales_23_1 | How was the price received for your milk product (e.g. yogurt, cheese, etc. ) sales impacted by Cyclone Idai, if at all? <b>Como foi o preço de venda dos produtos de lacticínios, afectado pelo cyclone Idai?</b><br>1 Increased → pr_sales_24 <b> aumentou</b>                                                                                                                                                                                                             | I__I  | *Select only one option                    |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                            |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------|
|               | <p>2 Decreased <b>diminuiu</b></p> <p>3 Stayed the same → pr_sales_24 <b>ficou na mesma</b></p> <p>-99 Do not know/refuse to answer → pr_sales_24 <b>Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                                                         |       |                                            |
| pr_sales_23_2 | <p>By how many meticals/kilogram did the price received by you for milk product sales decrease as a result of Cyclone Idai? <b>Quantos meticais /kilograma, o preço de venda dos produtos de laticínios diminuiu, devido ao ciclone Idai?</b></p>                                                                                                                                                                                                                     | _____ | *Enter -99 if do not know/refuse to answer |
| pr_sales_24   | <p>What other challenges have you faced in milk and milk product sales as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term? <b>Que outros desafios enfrentou nas vendas de leite e produtos de laticínios como resultado do Ciclone Idai? Você acha que os efeitos que você acabou de descrever são de curto ou longo prazo?</b></p> <p><i>*Please describe (open-ended) Por favor descreva abertamente</i></p> |       |                                            |

### SECTION 3: MILK QUALITY TESTING

**[Transition]: Enumerator: Now let's talk about milk quality checks and milk testing on incoming milk**  
**Inquiridor: Agora vamos falar sobre o control da qualidade do leite e os testes do leite recebido**

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                  |                                                                                                                               |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| pr_qual_1   | <p>Does your business do any quality testing on incoming milk? <b>Fazem algum teste de qualidade ao leite que recebem?</b></p> <p>1 Yes → <b>pr_qual_2 Sim</b></p> <p>2 No <b>Não</b></p> <p>-99 Do not know/refuse to answer → <b>pr_qual_5 Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                                                        | <input type="checkbox"/>                                                                                                                                                                         | *Select only one option                                                                                                       |
| pr_qual_1_1 | <p>Why do you not do any milk quality testing? <b>Porquê não fazem nenhum teste de qualidade do leite?</b></p> <p><i>*Please describe (open-ended) Por favor descreva abertamente</i></p> <p>→ <b>pr_qual_5</b></p>                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                  |                                                                                                                               |
| pr_qual_2   | <p>What do you test for? <b>Que testes fazem?</b></p> <p>1 Water adulteration <b>adulteração com água</b></p> <p>2 Bacteria <b>bactérias</b></p> <p>3 Butter and fat content <b>conteúdo de gordura</b></p> <p>4 Antibiotic residue <b>resíduos de antibióticos</b></p> <p>5 pH testing <b>teste de pH</b></p> <p>6 Testing for mastitis <b>teste de mastitis</b></p> <p>7 Testing for freshness of milk</p> <p>8 Other, specify _____</p> <p><b>Outros, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply</p> <p>*Prompt with responses</p> <p>*Ensure that if “-99” is chosen, no other option is chosen</p> |
| pr_qual_3   | <p>Do you test all deliveries, do random testing, or test on an ad hoc basis? <b>Vocês testam a totalidade do leite entregue, fazem por amostragem ou “ad hoc”?</b></p> <p>1 Test all deliveries <b>testa a totalidade das entregas</b></p> <p>2 Random check <b>controla por amostragem</b></p> <p>3 Ad-hoc/judgement basis <b>Ad-hoc</b></p>                                                                                                                                                                                                               | <input type="checkbox"/>                                                                                                                                                                         | *Select only one option                                                                                                       |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <p>4 Other, specify <b>Outros, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                     |
| pr_qual_4 | <p>What instruments did your business use for testing milk during the collection process in the last 12 months (July 2018 – July 2019)? <b>Que instrumentos usaram para testar o leite durante o processo recolha nos últimos 12 meses (1 de Julho 2018 a 30 de Junho 2019)</b></p> <p>1 No instruments <b>Nenhum instrumento</b></p> <p>2 Taste, smell, visual observation <b>Prova, cheiro e observação visual</b></p> <p>3 Milk density (use of lactometer) <b>Densidade do leite (uso de lactodensímetro)</b></p> <p>4 Clot-on boiling tests <b>teste de fervura</b></p> <p>5 Gerber tests for fat <b>Teste Gerber para a gordura</b></p> <p>6 pH tests level of acidity (lactic acid in mill) <b>Teste de pH, nível de acidez (ácido láctico)</b></p> <p>7 Temperature <b>temperatura</b></p> <p>8 Other, specify _____ <b>Outros, especifique</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p> | <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> | <p>*Select all that apply</p> <p>*Ensure if “-99” option is chosen, no other option is selected</p>                                                                                                                                                                 |
| pr_qual_5 | <p>Has your business rejected any milk on safety and/or quality grounds in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A empresa rejeitou leite por confiabilidade e/ou qualidade nos últimos 12 meses (1 de Julho de 2018 a 30 de Junho de 2019)</b></p> <p>1 Yes <b>sim</b></p> <p>2 No → <b>pr_qual_8 Não</b></p> <p>-99 Do not know/refuse to answer → <b>pr_qual_8 Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><input type="checkbox"/></p>                                                                                                                                                                                                                                                                                                 | <p>*Select only one option</p>                                                                                                                                                                                                                                      |
| pr_qual_6 | <p>On average, what percentage of incoming milk did your business reject on quality grounds during the last dry season (May through October 2018)? <b>Em média, que percentagem do leite recebido foi rejeitado por qualidade durante a época seca passada (Maio a Outubro de 2018)?</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>_____</p>                                                                                                                                                                                                                                                                                                                    | <p><b>*If there have records for this, then ask them to show their records and fill out from record, else ask the question</b></p> <p>*Ensure only numbers between 0 and 100 can be entered <b>Assegure-se que só podem ser inseridos números entre 0 a 100</b></p> |

|           |                                                                                                                                                                                                                                                                                                                                                                     |                     |                                                                                           |
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|           |                                                                                                                                                                                                                                                                                                                                                                     |                     | *Enter -99 if do not know/refuse                                                          |
| pr_qual_7 | On average, what percentage of incoming milk did your business reject on quality grounds during the last rainy season (November 2018 through April 2019)? <b>Em média, que percentagem do leite recebido foi rejeitado por qualidade durante a última época chuvosa (Novembro 2018 a Abril 2019)?</b>                                                               | _____               | *Ensure only numbers between 0 and 100 can be entered<br>*Enter -99 if do not know/refuse |
| pr_qual_8 | Does the business adjust the price paid for milk on the basis of any quality parameters (e.g. milk freshness) <b>A empresa/cooperative paga o leite com base nos parametros de qualidade (p.ex. frescura do leite)</b><br>1 Yes <b>Sim</b><br>2 No → <b>pr_qual_10 Não</b><br>-99 Do not know/refuse to answer → <b>pr_qual_10 Não sabe / se recusa a responder</b> | I__I                | *Select only one option                                                                   |
| pr_qual_9 | How is the price adjusted? <b>Como é ajustado o preço do leite?</b><br><i>*Please describe (open-ended) Por favor descreva abertamente</i>                                                                                                                                                                                                                          | *Ask if pr_qual_8=1 |                                                                                           |
| pr_qual10 | <b>*Ask if pr_train1 = 6</b><br>Did you make any change to your milk-testing procedures based on any training you received? If so, what training? How? <b>Fizeram alguma mudança nos procedimentos de testagem do leite com base em algum treino recebido? Se sim, qual treino? E como?</b><br><i>*Please describe (open-ended) Por favor descreva abertamente</i>  |                     |                                                                                           |

## SECTION 4: EQUIPMENT, FINANCE, AND INVESTMENTS EQUIPAMENTOS, FINANÇAS E INVESTIMENTOS

**[Transition]: Enumerator: Now, we want to talk about your equipment, financing, and investments** *Agora, queremos falar sobre seu equipamento, financiamento e investimentos*

|                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                 |
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| <b>[Transition]: Enumerator: Let's first talk about the equipment you currently own</b> <i>Vamos falar primeiro sobre o equipamento que você possui atualmente</i>                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                 |
| pr Equip_1                                                                                                                                                                                           | <p>What types of major equipment and facilities do you have? ? <b>Que tipos de equipamentos e instalações importantes possuem?</b></p> <p>1 Bulk milk tank <b>tanque para leite</b></p> <p>2 Pasteurizer <b>Pasteurizador</b></p> <p>3 Chilling system <b>Sistema de refrigeração</b></p> <p>4 Bulk fridge retails <b>Tanques refrigeradores de vendas a retalho</b></p> <p>Value-adding technology (please specify) _____ <b>Tecnologia que acrescenta valor (por favor especifique)</b></p> <p>-99 Do not know/refuse to answer → <b>pr Invest_1 Não sabe / se recusa a responder</b></p> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply</p> <p>*Prompt with options</p> <p>*Ensure if "-99" option is chosen, no other option is selected</p> |
| <b>[Enumerator instruction]: For each &lt;&lt;type of major equipment&gt;&gt;, ask the following questions. Ask questions "pr Equip_2 – pr Equip_6" for applicable options selected in "Equip_1"</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                 |
| pr Equip_2\$1<br>pr Equip_2\$2<br>pr Equip_2\$3<br>pr Equip_2\$4<br>pr Equip_2\$5                                                                                                                    | How many of <<type of major equipment>> do you own? <b>Quantos tipos de «equipamento principal» possuem?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/>                                                 | *Enter -99 if do not know/refuse to answer                                                                                      |
| pr Equip_3\$1<br>pr Equip_3\$2<br>pr Equip_3\$3<br>pr Equip_3\$4<br>pr Equip_3\$5                                                                                                                    | <p>Is the &lt;&lt;type of major equipment&gt;&gt; currently in working order? <b>O tipo de «equipamento principal» está actualmente funcional?</b></p> <p>1 Yes <b>sim</b></p> <p>2 No <b>não</b></p> <p>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b></p>                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>                             | *Select only one option for each type of equipment                                                                              |
| pr Equip_4\$1<br>pr Equip_4\$2<br>pr Equip_4\$3<br>pr Equip_4\$4<br>pr Equip_4\$5                                                                                                                    | What is the total capacity of <<type of major equipment>> in the last 12 months (July 1, 2018 – June 30, 2019)? <i>(in m<sup>3</sup>)</i> <b>Qual foi a capacidade total do tipo de &lt;&lt; equipamento principal &gt;&gt; nos últimos 12 meses (1 de julho de 2018 - 30 de junho de 2019)? (em m<sup>3</sup>)</b>                                                                                                                                                                                                                                                                         | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/>                                                 | *Enter -99 if do not know/refuse to answer                                                                                      |
| pr Equip_5\$1<br>pr Equip_5\$2<br>pr Equip_5\$3<br>pr Equip_5\$4<br>pr Equip_5\$5                                                                                                                    | In what year was <<type of major equipment>> installed? <b>Em que ano foi instalado o «equipamento principal»?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/><br><input type="text"/>                                                 | *Enter -99 if do not know/refuse to answer                                                                                      |



|                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                                                                                                                                                                                  |
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| pr_equip_6                                                                                                                                          | <p>Have you seen any changes in the purchase or improvement of any of the equipment you just talked about since participation in the MERCADO project, if at all? <b>Tem notado alguma mudança ou melhoria em algum dos equipamentos que falamos, desde a participação no projecto MERCADO?</b></p> <p><i>*Please describe (open-ended) Por favor descreva abertamente</i></p>                                   |       |                                                                                                                                                                                                                  |
| <p>[Transition]: Enumerator: Now I want to ask you questions about your investments <b>Agora quero fazer perguntas sobre seus investimentos</b></p> |                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                                                                                                                                                                                  |
| pr_invest_1                                                                                                                                         | <p>Did your business make any investments in its business in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A sua empresa realizou algum investimento para o seu negócio nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p> <p>1 Yes <b>Sim</b><br/> 2 No → pr_invest_5 <b>Não</b><br/> -99 Do not know/refuse to answer → pr_invest_5 <b>Não sabe / se recusa a responder</b></p> | _     | *Select only one option                                                                                                                                                                                          |
| pr_invest_2                                                                                                                                         | <p>What investments did the business make? <b>Quais foram os investimentos que fez?</b></p> <p><i>*Please describe (open-ended) Por favor descreva abertamente</i></p>                                                                                                                                                                                                                                          |       |                                                                                                                                                                                                                  |
| pr_invest_3                                                                                                                                         | <p>In total, how much did your business spend in new investments in the last 12 months (July 1, 2018 – June 30, 2019)? <b>No total, quanto a sua empresa gastou em novos investimentos nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b></p>                                                                                                                                                 | _____ | <p>*Explain that this could mean expenditure on new machinery, new software, new marketing investments, new vehicles etc. <b>Explique que são despesas com nova maquinaria, novo software, investimentos</b></p> |

|                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                                                                                                                                                                                                                                               |
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|                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      | novos em marketing, novos veículos, etc.<br>*Enter -99 if don't know/refuse<br>*If multiple investments were made, enter total amount invested in last 12 months <b>Se foram feitos vários investimentos, insira o valor total gasto nos últimos 12 meses</b> |
| pr_invest_4                                                                                                                                                       | What was the main source of financing for the investments in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Qual foi a principal fonte de financiamento para os investimentos nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Self-financed <b>Auto financiamento</b><br>2 Informal sources (family, neighbours, friends) <b>Fontes informais (familia, vizinhos, amigos)</b><br>3 Formal loans (banks etc.) <b>Empréstimos formais (bancos, etc.)</b><br>4 Grant <b>Donativos</b><br>5 Other, specify _____<br><b>Outros, especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b> | I__I | *Select only one option                                                                                                                                                                                                                                       |
| pr_invest_5                                                                                                                                                       | Does the business have any specific plans to invest in new equipment in the coming year? <b>A empresa/cooperativa tem algum plano específico para investir em novos equipamentos no próximo ano?</b><br>1 Yes <b>sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                                                                 | I__I | *Select only one option                                                                                                                                                                                                                                       |
| <b>[Transition]: Enumerator: Great! Now, let's talk about your financing and credit</b> <b>Ótimo! Agora vamos falar acerca dos vossos financiamento e crédito</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                                                                                                                                                                                                                                               |
| pr_credit_1                                                                                                                                                       | Did your business request or receive credit for any production costs in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A vossa empresa solicitou ou recebeu crédito para algum custo de produção nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                                                                                                                                                                                                                                                                                                                                                            | I__I | *Select only one option                                                                                                                                                                                                                                       |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                          |                                                                                          |
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|             | 1 Yes, applied and received → pr_credit_3<br><b>Sim, candidatou-se e recebeu</b><br>2 Yes, applied and did not receive <b>Sim, candidatou-se e não recebeu</b><br>3 No have not applied → pr_credit_7 <b>Não se candidatou</b><br>-99 Do not know/refuse to answer → pr_credit_7 <b>Não sabe / se recusa a responder</b>                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                          |                                                                                          |
| pr_credit_2 | Why did your business not receive any loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Porquê sua empresa não recebeu empréstimos de fontes formais nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 No formal financial institution present <b>Nenhuma instituição financeira formal esteve presente</b><br>2 Lack of collateral <b>Falta de garantia</b><br>3 High interest rate <b>alta taxa de juros</b><br>4 Other, specify <b>Outros , especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b>                                                                                                                                            | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | *Select all that apply<br>*Ensure if “-99” option is chosen, no other option is selected |
| pr_credit_3 | What were the primary purposes for obtaining loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quais foram os principais objetivos para obter empréstimos de fontes formais nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 Buying equipment for business <b>compra de equipamentos para o negócio</b><br>2 Managing short-term cash shortage <b>Fazer face a falta de dinheiro a curto prazo</b><br>3 Managing any unplanned shock to business <b>Gerir qualquer falha não planeada no negócio</b><br>4 Business expansion <b>Expansão de negócios</b><br>5 Other, specify <b>Outros , especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | *Select all that apply<br>*Ensure if “-99” option is chosen, no other option is selected |
| pr_credit_4 | What is the total value of loans from formal sources that your business obtained in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Qual foi o valor total dos empréstimos de fontes formais que vossa empresa obteve nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                               | _____                                                                                                                                    | *Enter in Metical<br>*Enter -99 if do not know/refuse to answer                          |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                  |                                                                                                                                                                                                               |
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| pr_credit_5   | At what interest rate did you borrow in the last 12 months (July 1, 2018 – June 30, 2019)? Think about only loans from formal sources <b>Que taxa de juro o empréstimo teve nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b><br><b>Pense apenas em empréstimos de fontes formais.</b>                                                                                                                                                                                                                                                                                            | _____                                                                                                                                                                                            | *Enter -99 if do not know/refuse to answer<br>*If interest rates differ across various sources, enter average interest rate <b>A taxa de juro varia entre várias fontes, insira a média das taxas de juro</b> |
| pr_credit_6   | What was the total cost of interest from paying off any business-related loans from formal sources in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Qual foi o custo total dos juros do pagamento de empréstimos, relacionados com o negócio, de fontes formais nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                                                                                                                                                                                                                                         | _____                                                                                                                                                                                            | *Enter in Metical<br>*Enter 0 if this expense was not incurred<br>*Ensure total cost in last 12 months is quoted                                                                                              |
| pr_credit_6_1 | What time was allocated for repayment? <b>Qual foi o tempo para o pagamento do empréstimo?</b><br><i>*Please describe (open-ended)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                  |                                                                                                                                                                                                               |
| pr_credit_7   | Has your business used any other financial products in the last 12 months (July 1, 2018 – June 30, 2019)? <b>A vossa empresa usou algum outro produto financeiro nos últimos 12 meses (de 1 de julho de 2018 a 30 de junho de 2019)?</b><br>1 No <b>Não</b><br>2 Business insurance <b>Seguro Empresarial</b><br>3 Livestock insurance <b>Seguro de gado</b><br>4 Mutual funds <b>fundos de contrapartida</b><br>5 Capital gain bonds <b>títulos de ganho de capital</b><br>6 Other, specify <b>Outros , especifique</b><br>-99 Do not know/refuse to answer <b>Não sabe / se recusa a responder</b> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | *Select all that apply<br>*Prompt with options<br>* Ensure if “0” or “99” options are chosen, no other option is selected                                                                                     |
| pr_credit_8   | What financing challenges, if any, does the business face? <b>Quais desafios de financiamento, se existentes, o negócio enfrenta?</b><br><i>*Please describe (open-ended) Por favor, descreva abertamente</i>                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                  |                                                                                                                                                                                                               |

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|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| pr_credit_9  | <p><i>*If no challenges described in pr_credit_8, skip question</i></p> <p>How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address financing challenges?</p> <p><i>Como a empresa tentou resolver esses desafios? O que funcionou e o que não resultou? O projeto MERCADO terá ajudado, de alguma forma, a resolver os desafios do financiamento?</i></p> <p><i>*Please describe (open-ended) Por favor, descreva abertamente</i></p> |
| pr_credit_10 | <p><i>*If no challenges described in pr_credit_8, skip question</i></p> <p>What does the business think will be necessary to tackle these financing challenges? <i>O que a empresa acha que será necessário para enfrentar esses desafios de financiamento?</i></p> <p><i>*Please describe (open-ended) Por favor, descreva abertamente</i></p>                                                                                                                                                                               |

## SECTION 5: STAFFING

[Transition]: Enumerator: Thank you! Now we want to talk to you about your staffing. *Muito obrigado! Agora queria fazer perguntas sobre os trabalhadores*

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                      |                               |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| pr_labor | <p>Which of the following types of employees did your business employ in the last 12 months (July 1, 2018 – June 30, 2019)? Qual dos seguintes categorias de empregados vossa empresa/cooperativa empregou nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</p> <ol style="list-style-type: none"> <li>1 Full time permanent – Male Tempo inteiro permanente - Masculino</li> <li>2 Full-time permanent – Female Tempo inteiro permanente - feminino</li> <li>3 Part Time Permanent – Male Meio período permanente - masculino</li> <li>4 Part time permanent – Female Meio período permanente - feminino</li> <li>5 Full-time seasonal – Male Tempo inteiro sazonal-Masculino</li> <li>6 Full-time seasonal- Female Tempo inteiro sazonal-Feminino</li> <li>7 Part Time seasonal – Male meio periodo sazonal-masculino</li> <li>8 Part Time seasonal – Female meio periodo sazonal -feminino</li> <li>9 Other, specify _____<br/>Outros, especifique</li> <li>-99 Do not know/refuse to answer → Section 6<br/>Não sabe / se recusa a responder</li> </ol> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <p>*Select all that apply</p> |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|

[Enumerator Instructions]: For each <<type of employee>> please answer the following questions. Ask only for applicable options selected in "pr labor"

|              |                                                                                                                                                                                                                                                                                                      |                          |                                                         |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------|
| pr_labor0\$1 | Does the record book have information on the <<type<br>of employee>> <b>O vosso livro de registos tem<br/>         informação sobre as categorias de empregados?</b><br>1 Yes <b>sim</b><br>2 No <b>não</b><br>-99 Do not know/refuse to answer <b>Não sabe / se<br/>         recusa a responder</b> | <input type="checkbox"/> | *Select only one<br>option for each type<br>of employee |
| pr_labor0\$2 |                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                         |
| pr_labor0\$3 |                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                         |
| pr_labor0\$4 |                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                         |
| pr_labor0\$5 |                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                         |
| pr_labor0\$6 |                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                         |
| pr_labor0\$7 |                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                         |
| pr_labor0\$8 |                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                         |
| pr_labor0\$9 |                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                         |

|                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                          |                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| pr_labor1\$1<br>pr_labor1\$2<br>pr_labor1\$3<br>pr_labor1\$4<br>pr_labor1\$5<br>pr_labor1\$6<br>pr_labor1\$7<br>pr_labor1\$8<br>pr_labor1\$9                   | How many of the following <<types of employees>> did your business have in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Quantos empregados das seguintes &lt;&lt; categorias de empregados &gt;&gt; a vossa empresa teve nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                                                       | _____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____                                                                     | *Enter -99 if number unknown but were employed at the business |
| pr_labor1_1\$1<br>pr_labor1_1\$2<br>pr_labor1_1\$3<br>pr_labor1_1\$4<br>pr_labor1_1\$5<br>pr_labor1_1\$6<br>pr_labor1_1\$7<br>pr_labor1_1\$8<br>pr_labor1_1\$9 | How many new employees of the following <<types of employees>> did your business hire in the last 12 months (July 2018 – July 2019) as a result of participation in the MERCADO project? <b>Quantos novos empregados das seguintes &lt;&lt; categorias de empregados &gt;&gt; a vossa empresa contratou nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b> | _____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____                                                                     | *Enter -99 if number unknown but were employed at the business |
| pr_labor2\$1<br>pr_labor2\$2<br>pr_labor2\$3<br>pr_labor2\$4<br>pr_labor2\$5<br>pr_labor2\$6<br>pr_labor2\$7<br>pr_labor2\$8<br>pr_labor2\$9                   | On average, how many months in the year did your business hire <<types of employees>> in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Em média, quantos meses por ano a vossa empresa contratou as seguintes &lt;&lt; categorias de empregados &gt;&gt; nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                        | _____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____                                                                     | *Enter -99 if number unknown but were employed at the business |
| pr_labor3\$1<br>pr_labor3\$2<br>pr_labor3\$3<br>pr_labor3\$4<br>pr_labor3\$5<br>pr_labor3\$6<br>pr_labor3\$7<br>pr_labor3\$8<br>pr_labor3\$9                   | On average, how many hours in a week did <<types of employees>> work in the last 12 months (July 1, 2018 – June 30, 2019)? <b>Em média, quantas horas por semana os empregados das seguintes &lt;&lt; categorias de empregados &gt;&gt; trabalharam nos últimos 12 meses (1 de julho de 2018 a 30 de junho de 2019)?</b>                                                     | _____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____                                                                     | *Enter -99 if number unknown but were employed at the business |
| pr_labor4\$1<br>pr_labor4\$2<br>pr_labor4\$3<br>pr_labor4\$4<br>pr_labor4\$5<br>pr_labor4\$6<br>pr_labor4\$7<br>pr_labor4\$8<br>pr_labor4\$9                   | What frequency of payment did you pay each <<type of employee>>? <b>Qual é forma de pagamento que usou para pagar cada &lt;&lt; categoria de empregado &gt;&gt;?</b><br>1 Hourly <b>por hora</b><br>2 Daily <b>por dia</b><br>3 Weekly <b>por semana</b><br>4 Monthly <b>mensal</b><br>5 Yearly <b>anual</b>                                                                 | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | *Select only one option                                        |
| pr_labor5\$1<br>pr_labor5\$2<br>pr_labor5\$3                                                                                                                   | How much did you pay on average to each <<type of employee>> including benefits, in that type of payment? Think about the average wages paid only in                                                                                                                                                                                                                         | _____<br>_____<br>_____                                                                                                                  | *Enter -99 if wages unknown                                    |

|                                                                                              |                                                                                                                                                                                                                                                                                                                                                 |                          |                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pr_labor5\$4<br>pr_labor5\$5<br>pr_labor5\$6<br>pr_labor5\$7<br>pr_labor5\$8<br>pr_labor5\$9 | the last 12 months. Please try to estimate if you do not know precise wages. <b>Quanto foi que pagou, em média, a cada &lt;&lt; categoria de empregado &gt;&gt; incluindo benefícios, nesse tipo de pagamento? Pense nos salários médios pagos apenas nos últimos 12 meses. Por favor, tente estimar se você não sabe os salários precisos.</b> | <br><br><br><br><br><br> | *If different wages paid, calculate and enter average amount<br><b>Se foram pagos salários diferentes, calculi e digite o valor médio</b><br>*Enter in Metical<br><b>Insira em meticais</b> |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



## SECTION 6: ADDITIONAL OPEN-ENDED QUESTIONS Questões adicionais abertas

1. What support from MERCADO has been most helpful to your business? Please explain. **Que apoio do projecto MERCADO tem sido mais útil para o vosso negócio? Por favor explique**

2. What support from MERCADO has not been helpful? What needs does your business have that are still unmet? How can MERCADO improve their support to your business? **Qual o apoio do MERCADO não tem sido útil? Quais são as necessidades da sua empresa que ainda não foram atendidas? Como o MERCADO pode melhorar seu apoio ao vosso negócio?**

3. Are there any challenges specifically faced by women in participating in your business that are not faced by men? Are there any kinds of support provided to overcome these challenges that you know of? **Há algum desafio específico enfrentado pelas mulheres que participam no vosso**

negócio e que não são enfrentadas pelos homens? Há algum tipo de apoio fornecido para superar esses desafios que você conhece?

4. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

Existe alguma coisa que eu não terei perguntado e que você gostaria de compartilhar comigo, ou tem alguma opinião adicional sobre o que discutimos hoje?

## MERCADO MIDTERM BREEDER SEMI-STRUCTURED SURVEY

### ADDENDUM TO FARMER SURVEY

#### SECTION 1: PROCUREMENT, SALES, AND FUTURE PLANS

**[Transition]** Enumerator: Thank you! Now we want to talk to you about your procurement and sales, specific to breeding activities

| VARIABLE                                                                               |                                                                                                                                                                                                      | ENUMERATOR INSTRUCTIONS                                         | PMP INDICATOR |
|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------|
| <b>[Transition]</b> Enumerator: Now we want to talk about your breeding of dairy cows. |                                                                                                                                                                                                      |                                                                 |               |
| Br_proc_1                                                                              | Do you use artificial insemination for breeding?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer                                                                                                | *Select only one option<br>*If br_proc_1 = -99, go to br_proc_3 |               |
| Br_proc_2                                                                              | Why do you not use artificial insemination for breeding?<br><i>Please describe (open ended)</i>                                                                                                      | *As if br_proc_1 = 2                                            |               |
| Br_proc_3                                                                              | What challenges, if any, does the firm face in obtaining genetics and breeding stock?<br><i>Please describe (open ended)</i>                                                                         |                                                                 |               |
| Br_proc_4                                                                              | How has the firm tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address these challenges?<br><i>Please describe (open ended)</i> | *If no challenges, skip question                                |               |
| Br_proc_5                                                                              | What does the firm think will be necessary to successfully tackle challenges related to obtaining genetics and breeding stock?<br><i>Please describe (open ended)</i>                                | *If no challenges, skip question                                |               |
| Br_proc_6                                                                              | What challenges, if any, does the firm face in getting the heifers and cows pregnant?<br><i>Please describe (open ended)</i>                                                                         |                                                                 |               |
| Br_proc_7                                                                              | How has the firm tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address these challenges?<br><i>Please describe (open ended)</i> | *If no challenges, skip question                                |               |
| Br_proc_8                                                                              | What does the firm think will be necessary to successfully tackle challenges related to production of dairy cows?<br><i>Please describe (open ended)</i>                                             | *If no challenges, skip question                                |               |

| VARIABLE                                                                             |                                                                                                                                                                                                                                                                           | ENUMERATOR INSTRUCTIONS                                                    | PMP INDICATOR |
|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------|
| Br_proc_9                                                                            | <p>Has success in breeding your dairy heifers/cows changed as a result of your engagement with the MERCADO project, if at all?</p> <p>1 Increased<br/>2 Decreased<br/>3 Stayed the same<br/>-99 Do not know/refuse to answer</p>                                          | <p>*Select one option<br/>*If br_proc_9 = -99, go to br_proc_11</p>        |               |
| Br_proc_10                                                                           | <p>Why do you think production of dairy cows has increased/decreased because of the MERCADO project?<br/><i>Please describe (open ended)</i></p>                                                                                                                          |                                                                            |               |
| Br_proc_11                                                                           | <p>Has your ease of obtaining genetics and/or breeding stock changed as a result of your engagement with the MERCADO project, if at all?</p> <p>1 Increased<br/>2 Decreased<br/>3 Stayed the same<br/>-99 Do not know/refuse to answer</p>                                | <p>*Select one option<br/>*If br_procure_11 = -99, go to br_procure_13</p> |               |
| Br_proc_12                                                                           | <p>Why do you think obtaining genetics has become easier/harder because of the MERCADO project?<br/><i>Please describe (open ended)</i></p>                                                                                                                               |                                                                            |               |
| Br_proc_13                                                                           | <p>Has your ease of obtaining genetics and breeding stock been impacted by Cyclone Idai, if at all?</p> <p>4 Increased<br/>5 Decreased<br/>6 Stayed the same<br/>-99 Do not know/refuse to answer</p>                                                                     | <p>*Select one option</p>                                                  | Indicator: #1 |
| Br_proc_14                                                                           | <p>How has the production of dairy cows been impacted by Cyclone Idai, if at all?</p> <p>1 Increased<br/>2 Decreased<br/>3 Stayed the same<br/>-99 Do not know/refuse to answer</p>                                                                                       | <p>*Select one option</p>                                                  | Indicator: #1 |
| Br_proc_15                                                                           | <p>What other challenges have you faced in procurement of genetics and breeding stock and production of dairy cows as a result of Cyclone Idai? Do you think the effects that you just described are short-term or long-term?<br/><i>Please describe (open-ended)</i></p> |                                                                            |               |
| [Transition]: Enumerator: Great! Now, let's talk about your sales of heifers or cows |                                                                                                                                                                                                                                                                           |                                                                            |               |

| VARIABLE                                                                                                                                      |                                                                                                                                                                             | ENUMERATOR INSTRUCTIONS                                                                 | PMP INDICATOR     |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------|
| <i>[Enumerator Instruction]: Enumerator: For questions br_sales_1 – br_sales_15, fill from record book; else ask respondent and then fill</i> |                                                                                                                                                                             |                                                                                         |                   |
| Br_sales_1                                                                                                                                    | How many unbred heifers did you sell, in the last 12 months (July 31, 2018 – June 30, 2019)?                                                                                | *Enter number<br>*Enter 0 if no sales<br>*Enter -99 if do not know/refuse to answer     |                   |
| Br_sales_2                                                                                                                                    | What price did you receive for unbred heifers, on average in the last 12 months (July 31, 2018 – June 30, 2019)?                                                            | *Enter in Metical<br>*Ask if br_sales_1>0<br>*Enter -99 if do not know/refuse to answer |                   |
| Br_sales_3                                                                                                                                    | Who are your main buyers for unbred heifers?<br><i>Please describe (open ended)</i>                                                                                         | *Ask if br_sales_1>0                                                                    |                   |
| Br_sales_4                                                                                                                                    | How many in-calf heifers did you sell in the last 12 months (July 31, 2018 – June 30, 2019)?                                                                                | *Enter number<br>*Enter 0 if no sales<br>*Enter -99 if do not know/refuse to answer     |                   |
| Br_sales_5                                                                                                                                    | What price did you receive for in-calf heifers, on average in the last 12 months (July 31, 2018 – June 30, 2019)?                                                           | *Enter in Metical<br>*Ask if br_sales_4>0<br>*Enter -99 if do not know/refuse to answer |                   |
| Br_sales_6                                                                                                                                    | Who are your main buyers for in-calf heifers?<br><i>Please describe (open ended)</i>                                                                                        | *Ask if br_sales_4>0                                                                    |                   |
| Br_sales_7                                                                                                                                    | In the last 12 months (July 31, 2018 – June 30, 2019), what were your sales of cows?                                                                                        | *Enter number<br>*Enter 0 if no sales<br>*Enter -99 if do not know/refuse to answer     |                   |
| Br_sales_8                                                                                                                                    | What price did you receive for cows, on average in the last 12 months (July 31, 2018 – June 30, 2019)?                                                                      | *Enter in Metical<br>*Ask if br_sales_7>0<br>*Enter -99 if do not know/refuse to answer |                   |
| Br_sales_9                                                                                                                                    | Who are your main buyers for cows?<br><i>Please describe (open ended)</i>                                                                                                   | *Ask if br_sales_7>0                                                                    |                   |
| Br_sales_10                                                                                                                                   | Does the business have any agreement with buyers of heifers/cows in the last 12 months (July 1, 2018 – June 30, 2019)?<br>1 Yes<br>2 No<br>-99 Do not know/refuse to answer | *Select only one option                                                                 | Indicator:<br>#23 |
| Br_sales_11                                                                                                                                   | How many agreements did you have with buyers of heifers/cows in the last 12 months (July 1, 2018 – June 30, 2019)?                                                          | *Ask if br_sales_10 = 1<br>*Enter -99 if do not know/refuse to answer                   | Indicator:<br>#23 |
| Br_sales_12                                                                                                                                   | Can you describe these agreements?<br><i>Please describe (open-ended)</i>                                                                                                   | *Ask if br_sales_10=1                                                                   |                   |

| VARIABLE                                                                                   |                                                                                                                                                                                                                            | ENUMERATOR INSTRUCTIONS                                                              | PMP INDICATOR |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------|
| Br_sales_13                                                                                | How are cows/heifers transported to your buyers?<br>1 Buyer comes to our doorstep<br>2 Business travels to buyer<br>3 Other, specify<br>-99 Do not know/refuse to answer                                                   | *Select all that apply<br>*Ensure that if "-99" is chosen, no other option is chosen |               |
| Br_sales_14                                                                                | What challenges, if any, does the business face in sales of cows/heifers?<br><i>Please describe (open-ended)</i>                                                                                                           |                                                                                      |               |
| Br_sales_15                                                                                | How has the business tried to address these challenges? What has worked, what has not? Has the MERCADO project helped you in any way to address any sales and marketing challenges?<br><i>Please describe (open-ended)</i> | *If no challenge, skip question                                                      |               |
| Br_sales_16                                                                                | What does the business think will be necessary to successfully tackle challenges related to sales of cows/heifers?<br><i>Please describe (open-ended)</i>                                                                  | *If no challenge, skip question                                                      |               |
| Br_sales_17                                                                                | How have sales of cows/heifers changed as a result of engagement with the MERCADO project, if at all?<br>1 Increased<br>2 Decreased<br>3 Stayed the same<br>-99 Do not know/refuse to answer                               | *Select one option<br>*If br_sales_17 = -99, go to br_sales_21                       |               |
| Br_sales_18                                                                                | Why do you think sales of cows/heifers changed because of the MERCADO project?<br><i>Please describe (open ended)</i>                                                                                                      |                                                                                      |               |
| <b>[Transition]:</b> Enumerator: Now I want to ask about your plans for your breeding herd |                                                                                                                                                                                                                            |                                                                                      |               |
| Br_sust_1                                                                                  | How much of your herd do you expect to sell in the next 12 months? Enter total number of cattle.                                                                                                                           | *Enter -99 if do not know/refuse to answer                                           |               |
| Br_sust_2                                                                                  | How large of a herd do you want to keep for production in the next 12 months? Enter total number of cattle.                                                                                                                | *Enter -99 if do not know/refuse to answer                                           |               |
| Br_sust_3                                                                                  | How do you plan to grow your breeding business?<br><i>Please describe (open ended)</i>                                                                                                                                     |                                                                                      |               |
| Br_sust_4                                                                                  | Are you planning to keep breeding in the future?<br><i>Please describe (open ended)</i>                                                                                                                                    |                                                                                      |               |

| VARIABLE  |                                                                                                                                                                                                                        | ENUMERATOR<br>INSTRUCTIONS | PMP<br>INDICATOR |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------|
| Br_sust_5 | From your perspective, will your breeding activities be sustainable beyond the end of the MERCADO project? Please explain. What are the biggest challenges to achieve sustainable increases in sales of cows/heifers?? |                            |                  |

**SECTION 2: ADDITIONAL OPEN-ENDED QUESTIONS**

1. What support from MERCADO has been most helpful to your business? Please explain.
2. What support from MERCADO has not been helpful? What needs does your business have that are still unmet? How can MERCADO improve their support to your business?
3. Are there any challenges specifically faced by women in participating in your business that are not faced by men? Are there any kinds of support provided to overcome these challenges that you know of?
4. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?



## **MERCADO MIDTERM QUALITATIVE DATA COLLECTION TOOLS**

1. Project Staff/Partners Interview Guide
2. Government Stakeholders Interview Guide
3. Community Livestock Workers Interview Guide
4. Dairy Farmers Focus Group Discussion Guide
5. Students Focus Group Discussion Guide
6. Student Interns Interview Guide
7. Teacher Interview Discussion Guide

## 1. Project Staff/Partners Interview Guide

Date (DD/MM/YY):

Interviewer/Facilitator Name:

Note Taker Name:

Name:

Name of Organization:

Gender:

Start Time:

Finish Time:

### INTRODUCTION

Our names are \_\_\_\_\_ and \_\_\_\_\_ (*Facilitator and Note Taker*). Thank you very much for taking the time to participate in this discussion. We are representing the organization IMPAQ International, a research company based in the United States. We are here as researchers/evaluators for the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project. Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique.

The interview will take approximately one hour. Please feel free to be open and honest with us while sharing your opinion. Everything you say here today will be kept confidential between us and the evaluation team. We are conducting this discussion as an independent entity and are not associated with any government body. Your names or other identifying information will not be used in any of our reports. You are free to choose whether to take part in this interview. If at any point after we begin you wish to leave, you may do so. If you choose not to take part, you will not be negatively affected in any way. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer.

In case of any further questions after you have participated, you can always contact data collection team members like me, or other members of our team. I am happy to share our contact information.

### Obtained written informed consent [Read Consent Form]

- a) Did you ask if the participant had any questions? ☐ Yes ☐ No
  - b) Did participant agree to participate? ☐ Yes ☐ No → STOP
  - c) Did you give participant copy of consent? ☐ Yes ☐ No
- 
1. What is your title? How long have you been involved with the MERCADO project and in what capacity?
  2. Compared to the previous dairy projects that Land O'Lakes implemented in Mozambique, how is MERCADO different?
  3. What are the barriers to growth in the dairy industry in Mozambique? How is MERCADO attempting to address these barriers?

4. Can you tell me about the activities that you or your project staff have provided as part of this project? (*Probe: **for MERCADO:** Trainings of farmers in animal husbandry/farm management; Capacity building of cooperatives; Capacity building of processors; Grants/co-investment to farmers for heifers/other equipment, etc.; Grants/co-investment to other dairy businesses for equipment, etc.; Nutrition training at schools; Curriculum development for technical schools on dairy; Student Interns; Training of CLWs; etc. **for TILLERS:** Training of farmers in fodder production; Training of artisans in making fodder production tools; training of artisan in business skills, establishment of answer plots; holding of technology expo)*
  - a. Please explain this activity. Is this activity proceeding as planned? If not, why not. If so, what has led to this?
  - b. How has this activity impacted project participants? Have these results occurred as planned? Why or why not?
  - c. Do men and women have equal opportunities to participate in project activities? Is there a difference between how this activity is affecting men and women? What do you think could be done better to increase the participation of women and improve their results?
  - d. How do you think the project could improve/strengthen the results within this activity?
  - e. Is this activity essential to reaching the results of increased productivity and increased trade? Why or why not?
  - f. From your perspective, will this activity be sustainable beyond project funding? Please explain. What are the biggest challenges to sustainability? How does the project plan to ensure sustainability of any achievements?
5. Are the implementation of some activities more successful than others? If so, which ones? Why? From your perspective, are there any activities that could be scaled down or eliminated and not affect project outcomes?
6. What challenges have you faced in project implementation? What about challenges for project participants? What have you done to address these challenges? Are there any challenges that are specific to women participants?
7. How effective is the monitoring strategy for collecting regular and reliable data on the project? What are the strengths and gaps in the monitoring system? To your knowledge, has monitoring and evaluation data been used to make programmatic decisions? If yes, can you give me an example?
8. Are expected results occurring as planned? To what extent will the objectives and project targets be achieved by the end of the project?
9. In your opinion, is there anything about the project that could be strengthened or done differently? What are the overall challenges and successes of the MERCADO project ?
10. Please tell us about any innovations, lessons learned, and best practices in implementation that you have discovered so far
11. How has the MERCADO project engaged the government and the private sector to strengthen and support the dairy industry in Mozambique? *Probe if there is more cooperation and understanding between both actors.*

12. *(If not mentioned earlier)* What effect has Cyclone Idai had on the dairy industry in Mozambique? What about for your planned project activities? Did it influence project implementation in any way?
13. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

*Thank you for your time and comments.*

## 2. Government Stakeholders Interview Guide

Date (DD/MM/YY):

Interviewer/Facilitator Name:

Note Taker Name:

Name:

Organization:

Gender:

Start Time:

Finish Time:

### INTRODUCTION

Our names are \_\_\_\_\_ and \_\_\_\_\_ (Facilitator and Note Taker). Thank you very much for taking the time to participate in this discussion. We are representing the organization IMPAQ International, a research company based in the United States. We are here as researchers/evaluators for the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project. Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique.

The interview will be approximately 30 minutes. Please feel free to be open and honest with us while sharing your opinion. Everything you say here today will be kept confidential between us and the evaluation team. We are conducting this discussion as an independent entity and are not associated with any government body. Your names or other identifying information will not be used in any of our reports. You are free to choose whether to take part in this interview. If at any point after we begin you wish to leave, you may do so. If you choose not to take part, you will not be negatively affected in any way. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer.

In case of any further questions after you have participated, you can always contact data collection team members like me, or other members of our team. I am happy to share our contact information.

### Obtained written informed consent [Read Consent Form]

- a) Did you ask if the participant had any questions? ☐ Yes ☐ No
  - b) Did participant agree to participate? ☐ Yes ☐ No → STOP
  - c) Did you give participant copy of consent? ☐ Yes ☐ No
- 
1. What is your title? How long have you been with [government agency/organization]?
  2. Can you tell me how you have engaged with the MERCADO project since it began in October 2016?  
How long have you been working with this project?
  3. Can you describe how the MERCADO project collaborates with your government department/organization? Is this an adequate level of collaboration? Why or why not? How can it be improved?

4. Have you worked with Land O'Lakes on any previous dairy projects implemented in Mozambique? Compared to the previous projects that you are familiar with, how is MERCADO different?
5. What are the barriers to growth in the dairy industry in Mozambique? What do you see as the government's role in addressing these barriers and strengthening the dairy sector? Are there any challenges specifically faced by women in the dairy value chain?
6. *(If not mentioned earlier)* What have been the effects of Cyclone Idai on the dairy industry?
7. How well do you think that the MERCADO project is aligned with Mozambique's priorities, policies, and regulatory frameworks? Please explain.
8. What are the overall challenges you see towards making policy reform or updating regulatory frameworks that support growth and investment in the dairy sector?
9. In your opinion, is there anything about the project that could be strengthened or done differently? Do you have any suggestions for improving the project?
10. What activities do you think the government of Mozambique will continue to move forward with after the project ends? *(probe for legislation and regulation)*
11. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

*Thank you for your time and comments.*

### 3. Community Livestock Workers Interview Guide

Date (DD/MM/YY):

Interviewer/Facilitator Name:

Note Taker Name:

Name:

Cooperative:

Gender:

Start Time:

Finish Time:

#### INTRODUCTION

Our names are \_\_\_\_\_ and \_\_\_\_\_ (Facilitator and Note Taker). Thank you very much for taking the time to participate in this discussion. We are representing the organization IMPAQ International, a research company based in the United States. We are here as researchers/evaluators for the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project. Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique.

The interview will be approximately an hour. Please feel free to be open and honest with us while sharing your opinion. Everything you say here today will be kept confidential between us and the evaluation team. We are conducting this discussion as an independent entity and are not associated with any government body. Your names or other identifying information will not be used in any of our reports. You are free to choose whether to take part in this interview. If at any point after we begin you wish to leave, you may do so. If you choose not to take part, you will not be negatively affected in any way. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer.

In case of any further questions after you have participated, you can always contact data collection team members like me, or other members of our team. I am happy to share our contact information.

#### Obtained written informed consent [Read Consent Form]

- a) Did you ask if the participant had any questions? ☐ Yes ☐ No
- b) Did participant agree to participate? ☐ Yes ☐ No → STOP
- c) Did you give participant copy of consent? ☐ Yes ☐ No

1. To begin, can you tell me a little bit about your background as a community livestock worker – when did you start? What motivated you to be a CLW?
2. I'd like for you to describe the activities that you participate in as part of the MERCADO project  
*Probe for health services offered to farmers, trainings, connection to private and/or government vets.*
3. What kind of training did you receive? Who provided it, and when? What did you like about it?  
What have you learned? Was it sufficient, or are there any areas where you need more support?

4. Could you describe the types of farmers who seek your services (size of their farms (small:1-3, medium: 4-19, or large: 20+), gender, etc.)? What are the greatest needs of the farmers seeking your services? Are there any challenges specifically faced by women farmers that are not faced by men farmers? Are there any kinds of support provided to overcome these challenges that you know of?
5. What challenges, if any, do you face in providing services to dairy farmers? *(for female CLWs)* Do you face any challenges as a female CLW that are not faced by your male colleagues? Are there any opportunities being a female CLW? *(for male CLWs)*
6. Were there any trainings you did with farmers or services you provided to them this year or last year which were particularly successful? Please explain.
7. What are the impacts of your work as a CLW on farmers? Were there any impacts that were unexpected or surprising to you? *Probe for safety and quality of milk, improved agricultural techniques and post-harvest handling, and use of improved infrastructure for farmers.*
8. Were there any trainings you did with farmers or services you provided to them this year or last year which were not successful? Which were the least successful? What needs do you think are still unmet? Were there any negative outcomes that were unexpected or surprising to you?
9. From your perspective, do the services you provide adequately address the needs of dairy farmers? In your opinion, is there anything that could be strengthened or done differently?
10. Do you plan to continue providing CLW provision after the project? Why or why not? If only a portion of the services, please explain.
11. Do you have any feedback on the support you receive from the MERCADO project? What has been particularly helpful? Where can you use more support?
12. *(If not mentioned earlier)* Did Cyclone Idai have any impact your activities as a CLW? Please explain.
13. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

*Thank you for your time and comments.*



## 4. Dairy Farmers Focus Group Discussion Guide

Date (DD/MM/YY):

Interviewer/Facilitator Name:

Note Taker Name:

Location:

Number of participants (F):

Number of participants (M):

Start Time:

Finish Time:

### INTRODUCTION

Our names are \_\_\_\_\_ and \_\_\_\_\_ (Facilitator and Note Taker). Thank you very much for taking the time to participate in this discussion. We are representing the organization IMPAQ International, a research company based in the United States. We are here as researchers/evaluators for the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project. Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique. Our discussion today will focus on the effect the MERCADO project has had on your farm management practices and productivity, as well as on any successes and challenges you've faced. This will help provide the research team with greater detail about the survey questions that you answered earlier.

The discussion will be approximately 90 minutes. Please feel free to be open and honest with us while sharing your opinion. Everything you say here today will be kept confidential between us and the evaluation team. We are conducting this discussion as an independent entity and are not associated with any government body. Your names or other identifying information will not be used in any of our reports. You are free to choose whether to take part in this discussion. If at any point after we begin you wish to leave, you may do so. If you choose not to take part, you will not be negatively affected in any way. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer.

If I have your permission, I would like to record our discussion today, for the purpose of taking notes later. This recording can only be accessed by our research team, and will not be shared with anyone else.

Does anyone have any questions for me?

In case of any further questions after you have participated, you can always contact data collection team members like me, or other members of our team. I am happy to share our contact information.

### Obtained written informed consent [Read Consent Form]

- a) Did you ask if the participants had any questions? ☐ Yes ☐ No
- b) Did participants agree to participate? ☐ Yes ☐ No → STOP
- c) Did ALL participants consent to be recorded? ☐ Yes ☐ No → DO NOT START TAPE RECORDER

1. To begin, would each of you please introduce yourself, and tell me a little bit about yourself as a farmer and dairy farmer—what you farm, when and how you began dairy farming, how many cows you have.
2. I would like for you to describe the activities that you participate in as part of the MERCADO project – both the training and support that you’ve received, and the resources that you’ve received. First, I’d like to talk about training.
  - a. What kind of training or help do you receive? (*Probe for farm management training, animal husbandry training, etc.*)
  - b. Who provided it, and when?
  - c. What did you like about this? What have you learned? Have you made any changes as a result of this training? What did you not like about your training?
  - d. What are specific results that you have seen as a result of this training? (*Probe for increased production, etc.*) Are there any negative results?
  - e. Are there any areas where you need more support?
3. Now, I’d like to talk about resources.
  - a. What kind of resources did you receive? (*Probe for receipt of heifers, etc.*)
  - b. Who provided it, and when?
  - c. What did you like about these resources? What did you not like?
  - d. What are specific results that you have seen as a result of this resource? Are there any negative results?
  - e. Are there any additional resources that you need?
4. Have you changed any of your farming practices because of the project training? If so, which ones? *Probe for housing, feeding, water, animal health, etc. If not: Why didn’t you? Has your participation in the MERCADO project had any effect, positive or negative, on your dairy practices and productivity that you did not mention already? If yes, how? Probe for feeding practices, practices for ensuring higher quality milk, increased milk production/lactation days, herd health, breeding, milking practices, etc. as well as the specific input/service suppliers.*
5. Has your participation in the MERCADO project changed your business, financial, or marketing practices that you did not mention already? If yes, how? *Probe for participation in cooperatives, selling practices, post-harvest handling, farm management and record keeping, access to financing, etc. as well as the specific input/service suppliers.*
6. From your perspective, which activities and processes will be sustainable beyond the end of the MERCADO project and which will not be sustainable? Please explain. What are the biggest challenges to achieve sustainable increases in sales and quality?
7. (*If not mentioned earlier*) Has Cyclone Idai had any effect on your dairy farming activities? *Probe for input supply, sales, and distribution, and if the effects (such as herd reduction) are short- or long-term.*
8. From your perspective, does the overall MERCADO project adequately address the needs of dairy farmers like you? In your opinion, what other activities could the project do with you to have a greater impact?

9. Are there any challenges specifically faced by women dairy farmers that are not faced by men farmers? Please explain. Are there any kinds of support provided from the MERCADO project to overcome these challenges that you know of?
10. Looking forward, what would you like to do with your dairy farm? Are any of you thinking of expanding? What influences these different considerations? What kind of improvements or additional supports are needed?
11. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

*Thank you for your time and comments.*

## 5. Students Focus Group Discussion Guide

**Date (DD/MM/YY):**

**Interviewer/Facilitator Name:**

**Note Taker Name:**

**Educational Institution:**

**Number of participants (F):**

**Number of participants (M):**

**Start Time:**

**Finish Time:**

### INTRODUCTION

Our names are \_\_\_\_\_ and \_\_\_\_\_ (Facilitator and Note Taker). Thank you very much for taking the time to participate in this discussion. We are representing the organization IMPAQ International, a research company based in the United States. We are here as researchers/evaluators for the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project. Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique.

The discussion will be approximately 30 minutes. Please feel free to be open and honest with us while sharing your opinion. Everything you say here today will be kept confidential between us and the evaluation team. We are conducting this discussion as an independent entity and are not associated with any government body. Your names or other identifying information will not be used in any of our reports. You are free to choose whether to take part in this interview. If at any point after we begin you wish to leave, you may do so. If you choose not to take part, you will not be negatively affected in any way. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer.

In case of any further questions after you have participated, you can always contact data collection team members like me, or other members of our team. I am happy to share our contact information.

### Obtained written informed consent [Read Consent Form]

- a) Did you ask if the participant had any questions? ☐ Yes ☐ No
- b) Did participant agree to participate? ☐ Yes ☐ No → STOP
- c) Did you give participant copy of consent? ☐ Yes ☐ No

1. To begin, please introduce yourself, and tell me about your training in agriculture (i.e. your area of focus in technical school) and why you chose it?
2. What did you like about the dairy curriculum? What have you learned? Was it sufficient, or are there any areas where you need more support? What did you like least about the curriculum? Why?
3. What would you have liked to learn in the curriculum that you didn't?
4. Do you see dairy as an attractive sector to work in? Why or why not?

5. What have you done, or what do you hope to do, with your dairy training upon graduation? What type of work do you plan to do upon graduation? Will it be in the dairy sector? Why or Why not?
6. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

*Thank you for your time and comments.*

## 6. Student Interns Interview Guide

Date (DD/MM/YY):

Interviewer/Facilitator Name:

Note Taker Name:

Name:

Educational Institution:

Host Business for Internship:

Start Time:

Finish Time:

### INTRODUCTION

Our names are \_\_\_\_\_ and \_\_\_\_\_ (Facilitator and Note Taker). Thank you very much for taking the time to participate in this discussion. We are representing the organization IMPAQ International, a research company based in the United States. We are here as researchers/evaluators for the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project. Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique.

The discussion will be approximately 30 minutes. Please feel free to be open and honest with us while sharing your opinion. Everything you say here today will be kept confidential between us and the evaluation team. We are conducting this discussion as an independent entity and are not associated with any government body. Your names or other identifying information will not be used in any of our reports. You are free to choose whether to take part in this interview. If at any point after we begin you wish to leave, you may do so. If you choose not to take part, you will not be negatively affected in any way. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer.

In case of any further questions after you have participated, you can always contact data collection team members like me, or other members of our team. I am happy to share our contact information.

### Obtained written informed consent [Read Consent Form]

- d) Did you ask if the participant had any questions? ☐ Yes ☐ No
- e) Did participant agree to participate? ☐ Yes ☐ No → STOP
- f) Did you give participant copy of consent? ☐ Yes ☐ No

1. To begin, please introduce yourself, and tell me about your training in agriculture (i.e. your area of focus in technical school) and why you chose it?
2. Can you describe the dairy husbandry training that you received in school as part of the MERCADO project?
  - a. What did you like about the dairy curriculum? What have you learned? Was it sufficient, or are there any areas where you need more support? What did you like least about the curriculum? Why?
  - b. What would you have liked to learn in the curriculum that you didn't?

3. Can you tell me about the internship you participated in as part of the MERCADO project?
  - a. When was your internship, and with what business? How long did it last?
  - b. What did you like about the internship? What have you learned? Do you think it was sufficient to prepare someone for a career in dairy? What did you like least about the internship? Why?
  - c. What would you have liked to have done as part of your internship that you didn't?
4. How did your courses in school and the MERCADO internship relate to one another? What were your experiences with each? What do you feel was most effective about the practical versus classroom instruction? What could have been done to make this a better learning experience?
5. Do you see dairy as an attractive sector to work in? Why or why not?
6. What have you done, or what do you hope to do, with your dairy training upon graduation? What type of work do you plan to do upon graduation? Will it be in the dairy sector? Why or Why not?
7. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

*Thank you for your time and comments.*

## 7. Teacher Interview Discussion Guide

Date (DD/MM/YY):

Interviewer/Facilitator Name:

Note Taker Name:

Name(s):

School:

Start Time:

Finish Time:

### INTRODUCTION

Our names are \_\_\_\_\_ and \_\_\_\_\_ (Facilitator and Note Taker). Thank you very much for taking the time to participate in this discussion. We are representing the organization IMPAQ International, a research company based in the United States. We are here as researchers/evaluators for the Mozambique Expansion of Rural Cattle and Dairy Opportunities (called MERCADO) project. Our goal is to capture a wide range of viewpoints that can usefully inform Land O'Lakes dairy activities in Mozambique.

The discussion will be approximately 15 minutes. Please feel free to be open and honest with us while sharing your opinion. Everything you say here today will be kept confidential between us and the evaluation team. We are conducting this discussion as an independent entity and are not associated with any government body. Your names or other identifying information will not be used in any of our reports. You are free to choose whether to take part in this interview. If at any point after we begin you wish to leave, you may do so. If you choose not to take part, you will not be negatively affected in any way. You can also choose to refuse to answer any questions you are uncomfortable with or do not want to answer.

In case of any further questions after you have participated, you can always contact data collection team members like me, or other members of our team. I am happy to share our contact information.

1. To begin, please introduce yourself, and tell me about your background as a teacher -- how long have you been a teacher and how long have you been at this school?
2. I'd like for you to describe the activities that you participate in as part of the MERCADO project (*Probe curriculum training, nutrition training, etc.*) How were these activities received by your students?
3. *For schools:* How has this helped your students? Do you think they understand the nutritional value of milk? Are they aware of the availability of locally produced milk? Do you think there is a greater demand for milk?
4. *For educational institutions:* How does the curriculum you teach now compare to what you have before? What do you like about it? Do you have any suggestions for how it can be improved?
5. Is there anything that I did not ask about that you would like to share with me, or do you have any additional thoughts about what we have discussed today?

*Thank you for your time and comments.*



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## ANNEX G. MODIFICATIONS FROM BASELINE TO MIDTERM

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The farmer survey and semi-structured surveys for cooperatives, processors, and breeder were different at midterm compared to baseline. We describe below the reasons for these changes, implications for the study, and then detail the exact changes made.

### ***Reasons for Changes***

At the request of Venture37, we added questions to the surveys to provide additional monitoring data and to capture information about project activities such as record-keeping and engagement with MERCADO. Additionally, at the request of Venture37, we also edited the wording of several questions to hopefully improve clarity. Finally, at the request of Venture37, we shortened some sections in the farmer survey to reflect the shift in focus from certain project activities like finance and investments.

### ***Implications of Changes***

- For new questions that were added to the farmer survey, we are unable to present baseline to midterm comparisons for these questions.
- The changes in ordering of questions from baseline to midterm in the farmer survey led to different rates of non-responses from baseline to midterm for certain questions. This is because they were asked earlier or later in the survey at midterm relative to baseline.
- The slight discrepancy in how questions were worded and asked is a limitation, as respondents could have interpreted the questions differently at baseline and midterm based on these changes.
- Many questions in the farmer survey required enumerators to look in farmer record books and fill out responses. While many farmers had record books, they were not very detailed. Since questions on milk production and sales were quite detailed, and given the quality of record books, these crucial questions had many non-responses.
- Changes made to the cooperatives, processors, and breeder survey were quite extensive. This led to comparability issues wherein only key performance indicators could be reported for both baseline and midterm for cooperatives, processors, and breeders.

### ***Changes in Farmer Survey at Midterm***

- Ordering of questions in the survey:
  - Questions on training and knowledge which at baseline were asked towards the end of the survey were asked in the middle of the survey at midterm. Therefore, questions on key indicators such as milk production and sales were pushed towards the latter half of the survey.
  - Inputs received by farmers and sources of inputs were moved towards the first half of the survey.
- Changes in enumerator instructions:
  - Qualifier “see from record book and fill” were added to many questions on milk production and milk sales and lactation and birthing history. Since the record books might not have been that detailed, there was a high rate of non-response for these questions.
- New sections added:
  - Engagement with MERCADO.

- Impact of Cyclone Idai.
- Questions removed:
  - Costs of forage and feed.
  - Several questions from the section on ‘finance and investments’ including credit application, value of credit, purpose of credit, interest rate, source of credit, and time allocated for repayment.
- New questions added:
  - Second and third result of survey attempt and reasons.
  - Number of pure bred, cross bred, and total male calves.
  - Detailed record book information for each cow including: first time cow gave birth, times the cow was pregnant, last calving, milk produced yesterday, peak production, stopped producing milk last time and second to last time, and second to last time cow gave birth.
  - Minimum and maximum lactation period and minimum and maximum calving interval for producers with 10 or more cows.
  - Use, sources for replacement, and ease of access to milk filters, milk feeders, and milk chilling equipment.
  - Development and use of a business plan.
  - Number of cows producing milk yesterday, volume of milk production yesterday and utilization of milk yesterday.
  - Number of cows producing milk in the last rainy and dry seasons.
  - Proportion of milk sold to processors.

### ***Changes in Cooperative and Processor Surveys at Midterm***

- Ordering of questions:
  - As a result of the addition of new sections, the ordering of sections was very different from baseline to midterm.
- New section added:
  - Section on ‘record keeping’ added. Included detailed questions on record keeping which were not asked at baseline
  - Section on ‘credit’ was added at midterm for cooperatives
- New questions added:
  - All milk procurement and milk sales questions were modified to seasonal questions at midterm compared to annual questions at baseline.
  - Impact of milk procurement and sales due to MERCADO project.
  - Impact of milk procurement and sales due to Cyclone Idai.
  - Average price for milk for procurement and sales in both seasons.
  - Milk transportation.
  - Formal agreements with and support services to suppliers.
  - Buyers of milk for cooperatives.
  - Instruments used for milk testing.
  - Milk rejection rate for cooperatives.
  - Processing volume, capacity, and utilization by season.
- Options for questions modified:

- o Milk quality issues for which testing is done: addition of options such as butter and fat content, mastitis, milk freshness, etc.

***Changes in Breeder Survey at Midterm***

- New questions added:
  - o At baseline, the breeder survey was a KII, while at midterm we included quantitative questions. Quantitative questions on procurement, sales, and future plans for breeding cattle were added at midterm.