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► Finding the milky way

A market systems analysis of Uganda's dairy sector with a focus on trade and employment



Project: Trade for Jobs

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Executive summary

This report presents a market systems analysis (MSA) of Uganda's dairy sector under the Trade for Jobs project. Using a systems approach, the study identifies constraints, opportunities, and intervention areas aimed at enhancing trade and creating better employment outcomes for youth, women, and those living in poverty. The analysis combines desk research and fieldwork across Uganda's key dairy regions to provide a comprehensive understanding of the sector.

Uganda's dairy sector has experienced rapid growth. It experienced a five-fold increase over the last 15 years, which has been driven by private sector investments, improved farming practices, and government initiatives. The sector plays a pivotal role in the country's economy and exports, with substantial room for further growth. Some estimates suggest that the sector has the potential to triple its production and more than double its exports. With its low production costs and favourable market conditions, Uganda has become a key dairy exporter in East Africa.

Despite these advancements and growth potential, the sector faces constraints at three levels, which limit its export growth and impact on creating more and better jobs.

- ▶ **Core value chain:** Low on-farm productivity, high post-harvest losses and insufficient cooling capacity at Milk Collection Centres (MCCs), underutilized processing capacity, and over-reliance on the Kenyan market for exports.
- ▶ **Supporting functions:** Insufficient access to finance, poor extension services, and limited availability of quality inputs, feed, animal breeds and animal health services limit productivity and farmer incomes.
- ▶ **Rules and regulations:** Weak enforcement, overlapping agency mandates, and a large informal sector make it difficult to ensure quality standards and compliance with market requirements.

To address these issues, the project should consider working in three targeted intervention areas to:

- ▶ **Build-up farm-level productivity:** Support farmers in adopting better breeding practices, improved feed and water management, enhanced animal health services to increase milk yields and quality.
- ▶ **Enhance MCC handling, cooling capacity and outreach:** Invest in cooling and storage facilities, reduce post-harvest losses, and enable MCCs to better integrate informal producers into the formal market, especially during low seasons.
- ▶ **Strengthen regulatory and export promotion functions:** Enhance sector oversight, enforce quality standards to optimise efficiency and quality in the sector, as well as diversify export markets to increase value addition and employment opportunities, particularly for small-scale processors. This can be done through strengthening sector coordination and collaboration through the development and strengthening of a sectoral coordination platform.

These interventions aim to unlock the sector's full potential, facilitate sustainable growth that is export oriented, increase farmer incomes, and create new jobs for processors and in supporting sector service providers.

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1. Introduction and context

1.1. The project

The International Labour Organization (ILO), within the framework of [Systems Change Initiative](#), and the International Trade Centre (ITC) are piloting a new Trade for Jobs project in Uganda. The project, which is done in close collaboration with the Swedish Embassy in Kampala, aims to promote trade as a mechanism for creating more and better jobs - particularly for youth, women and those living in poverty. If funded, the project will implement using the market systems development approach (see the box below).

► What does a systems approach to decent work involve?

A systems approach challenges traditional models of development assistance to improve the:

- **Sustainability of outcomes:** Improvements in the decency of work can benefit all – especially the most marginalised - beyond the period of intervention.
- **Scale of outcomes:** Innovations are replicated, spill over and spread beyond just those partners and areas the intervention is directly working with

It achieves this not by rolling out a prescriptive approach or a fixed methodology, but by applying three key principles:

- **Analysis-focused:** Instead of pushing predetermined solutions, a systems approach starts by analysing the local context to identify what really causes decent work deficits, in order to prioritise those which can practically be solved and understand how.
- **Partner-driven:** Working to allow local actors with a stake in progress to own and drive forward the change process through a process known as ‘facilitation’.
- **Evidence-based adaptation:** Blending design and implementation through rapid cycles of planning, action, measurement, reflection and revision.

The ILO’s systems approach to decent work draws on other global development movements such as Doing Development Differently and Problem-Driven Iterative Adaptation. Its tools and implementation guidance are drawn directly from a Market Systems Development (MSD) approach.

This work builds on an initial sector selection study¹, which identified the dairy and tourism sectors as high potential sectors for a future Trade for Jobs project in Uganda. As a next step in the project design process, ILO and ITC have conducted market systems analyses (MSAs) of both the dairy and tourism sectors to identify systemic constraints to trade and better employment outcomes for youth, women and those living in poverty within Uganda’s dairy sector. The analysis also outlines possible intervention areas that a project could pursue through implementation.

The remainder of this report unpacks the dairy MSA. The tourism MSA has been conducted in a separate but corresponding report.

1.2. Research methods

The research is delivered based on the methodological guidance from chapter 3 of the ILO’s [Value Chain Guide for Decent Work](#)² as well as it [Cross-border value chain development: A rough guide to market systems development for](#)

¹ [Trade for Jobs Uganda: Sector selection study. Examining job and export potential in nine sectors](#). ILO and ITC. (14 Nov 2024).

² [Value Chain Development for Decent Work: A systems approach to creating more and better jobs - 3rd edition](#). ILO. 2021.

[decent work](#)³. The research uses different types of data (primary and secondary) and multiple methods (e.g., observations, key informant interviews, etc.).

The research was carried out in two phases:

- ▶ **Desk research** on available literature to provide a framework for the primary data collection process. This included review of national laws, sector data and market trends, as well as studies conducted by other government, research institutes and development agencies; and
- ▶ **Field research** in the central, southwestern, eastern and northeastern regions, involving in-depth, semi-structured interviews with key informants and market actors (see Annex 1 for full list). These interviews provided an in-depth picture of the sector from a diverse set of actors and opinions, which included:
 - **Government actors**, such as the Ministry of Agriculture Animal Industry and Fisheries (MAAIF), the Uganda National Bureau of Standards (UNBS), the Dairy Development Authority (DDA), the National Drug Authority (NDA), among many others.
 - **Sector associations**, including the Uganda Veterinary Association; the Uganda Dairy Processors Association; and the Livestock Development Forum
 - **Private sector actors**, including dairy farmers, large and small-scale dairy processors; input service providers; informal traders; milk collection centres; dairy cooperatives; transporters; retailers; private sector animal breeding, genetics and nutrition service providers; and financial service providers.

1.3. Report structure

The report provides a brief overview of the dairy sector, how it has developed over time and how the various interactions along the value chain impact the project's target group (Section 2). It then provides an overview of the dairy market system, the key constraints and their possible root causes (Section 3). Finally, it uses the analysis findings to develop project intervention recommendations and identify potential partners who could strengthen dairy product exports and facilitate the integration of women, youth and the poor into the sector in a lasting way (Section 4).

Notes

- ▶ **On confidentiality.** All data collected through primary research has been anonymised so that individuals cannot be identified. Instead, we refer in generic terms to "respondents".
- ▶ **On the limitations of the study.** The study is largely built on the perceptions and opinions of key stakeholders in the sector. In addition, a limited number of stakeholders were interviewed due to resource constraints. Although information was triangulated from different sources wherever possible, it is acknowledged that not all opinions and perceptions could be cross-checked and validated.
- ▶ **About the views and opinions.** The views and opinions in this assessment are those of the authors and not those of the International Labour Organization or its country office or the International Trade Centre.

³ *Cross-Border Value Chain Development: A Rough Guide to Market Systems Development for Decent Work*. ILO. 2022.

2. Sector structure

2.1. Market overview

A booming sector with room for growth

Uganda's dairy sector has experienced rapid growth over the last two decades. The sector has been growing at an average annual rate of 11 per cent between 2018 and 2022⁴ helping accelerate its transformation from a mostly subsistence sector into a dynamic and modern industry.

This rapid expansion has resulted from government and donor-funded initiatives, private sector investments and use of better technologies. Today, the sector is key to the country's economic growth, development and socio-economic transformation and exports.⁵

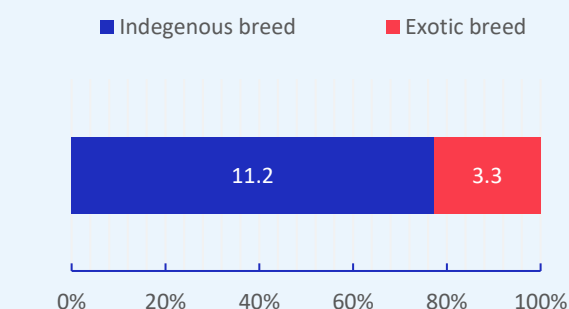
Despite the sector's current strong position in Uganda's economy, it operates below its potential both for production and exports. Per Uganda's Dairy Development Authority (DDA), the country has the potential to produce 10 billion litres of milk per year (over 6 billion litres more than its current annual production).⁶ Of current milk production, around 60 per cent is sold informally, mostly at the local level, and only one-fifth of it has any value addition. Further, the sector is estimated to have an unrealized export potential value of USD 136 million.⁷

An overview of the sector constraints

The sector produces below its potential for several reasons. This is principally due to its low production yields, which result from low quality breeding stock, animal diseases, and high post-harvest losses attributed to quality-related issues and inadequate storage facilities. On the export side, the sector has an over-reliance on a small number of markets for exports, specifically Kenya. Common export barriers include technical and non-tariff trade barriers that limit exports to promising export markets, such as market protectionism, excessive customs and administrative procedures, and quality and hygiene standards.

The dependence on local cattle breeds limits productivity. Most dairy farming households rear indigenous cattle breeds such as Ankole, Nganda, and Zebu. While farmers prefer local cattle for their adaptability to a prevailing climate with longer dry periods as well higher resilience to diseases relative to the exotic ones, they have extremely low productivity at about three litres of production per day compared to up to 40 litres for exotic breeds raised under ideal farm management practices.

► Cattle population (in millions); Dominated by indigenous breeds



Uganda Bureau of Standards, 2024

⁴ Jean Ruth, Komugisha. September 2023. *Dairy Industry in Uganda 2022-2023*. Research Global.

⁵ Ariong, Richard; Van Campenhout, Bjorn; Kariuki, Sarah W.; and Chamberlin, Jordan. *Enhancing milk quality in Uganda: Challenges and innovations in the dairy value chain*. Blog: Research Post. Innovation Policy and Scaling. International Food Policy Research Institute.

⁶ *Dairy Industry in Uganda 2022-2023*.

⁷ International Trade Centre: [ITC Export Potential Map](#)

Despite their limited usage (see figure), exotic crossbreed cattle contributed 75 per cent of Uganda's milk production in 2023.⁸

Post-harvest losses are highly pronounced, especially at milk collection and bulking stages. These losses arise mainly due to poor milk quality, inadequate storage facilities, a failure to find markets, and spillage during loading and offloading or during measuring and testing.⁹

Uganda's milk quality has improved, though market differentiation for quality remains low. Milk collection centres (MCCs) pool milk from multiple suppliers and mix it together as they do not assess milk quality (butter fat content) at MCC level. Once mixed together, better quality milk loses its premium, which disincentives farmers to enhance quality even though some processors pay a premium for higher quality milk.¹⁰

Processors generally operate below installed capacity, and will continue to do so as two new large-scale processors come online in 2025 and add further processing capacity to the country. This indicates room to absorb more milk to manufacture high-value dairy products that can earn the country more foreign exchange.

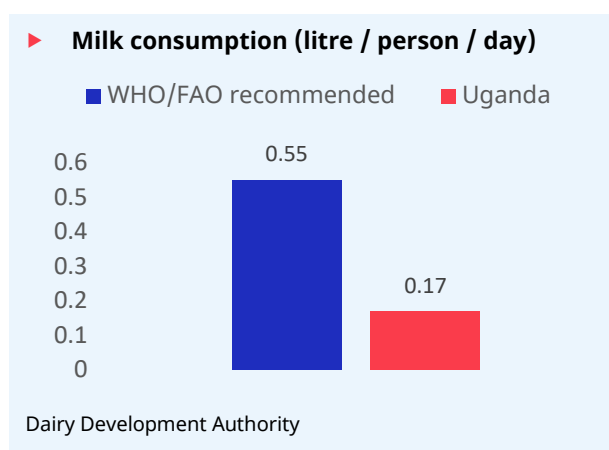
Uganda relies heavily on neighbouring East African countries for its dairy exports, notably Kenya, which is the destination for close to 80 per cent of its milk exports. Over reliance on the Kenyan market makes Uganda's dairy sector highly vulnerable to policy changes implemented by Kenya.¹¹ Recent bans and non-issuance of permits imposed by Kenya on dairy imports from Uganda have severely hurt Uganda's dairy farmers.¹²

Sufficient demand for future growth

Milk consumption in Uganda is low, owing mainly to low-income levels and a limited milk drinking culture.

Milk consumption has not increased significantly in the past 50 years, and the milk consumption levels recommended by WHO/FAO are more than triple the average milk consumption in Uganda.¹³ Many stakeholders indicated a need to fill this void and enhance domestic consumption – an area that government along with various development actors are working on.

Additionally, international demand has increased, particularly in the EAC, as countries increase in population and wealth and become more urbanised.



A shifting government landscape

The Dairy Development Authority (DDA) has overseen the sector's management and development. It has worked to promote investments in milk processing facilities, milk production, and formation/strengthening of cooperatives

⁸ Ouma, E., Gebreyohanes, G., Mwai, O., Marshall, K., Lukuyu, B., Mukasa, C., Oba, P., Dione, M., Businge, M., Namatovu, J., Notenbaert, A., van der Hoek, R., Mourad, R. and Baltenweck, I. 2024. *Theory of change for the dairy value chain in Uganda, developed for the CGIAR Initiative Sustainable Animal Productivity for Livelihoods, Nutrition and Gender Inclusion*. Nairobi, Kenya: International Livestock Research Institute (ILRI).

⁹ *Enhancing the performance of Uganda's dairy value chain*. Internal Working Document. Dairy Policy Action Lab. 2022.

¹⁰ *Investing in high-end dairy products is critical for fostering Uganda's agro-industrialisation agenda*. Policy Brief. Economic Policy Research Centre. 2021

¹¹ Nkuingoua Nana, J.C., Pernechele, V., Meilland, T., Munyuka Ariong, R. & Otikal, K. 2022. Analysing milk price incentives to strengthen policies for dairy production and exports in Uganda. Technical note. Monitoring and Analysing Food and Agriculture Policies (MAFAP). Rome, FAO. <https://doi.org/10.4060/cc3804en>.

¹² *Brookside, traders claim bias in issuance of Uganda dairy import permits*. Business Daily. 2022.

¹³ *Enhancing the performance of Uganda's dairy value chain*.

and MCCs in the Southwest and most recently in the Central, Eastern and Northeast regions. However, as of January 2025, the DDA was subsumed into MAAIF, ending 15 years of its semi-autonomous, parastatal status. Many stakeholders across the sector and in government expressed concern as DDA functions will now compete for resources in an already overstretched and considerably under-resourced MAAIF that has a range of mandates and priorities.

Despite this change, the government still highly prioritises the sector, and has included it in several key strategies and plans:

- ▶ Dairy is among 18 strategic commodities under the Agro-Industrialisation Programme of the third National Development Plan (NDP III) 2020/21–2024/25. Here, priorities are placed on improving production and productivity through value addition and processing, access to improved technologies such as breeds through artificial insemination, regulations to monitor milk quality, consumer safety, favourable taxation, targeting export markets, and strengthening producer cooperatives.
- ▶ The Dairy Policy Action Plan (DPAP) aims to guide policy, planning and investment decisions to enhance performance of Uganda's dairy value chain in alignment with the government initiatives.
- ▶ Uganda, through its updated Nationally Determined Contributions (NDCs), has committed to reduce greenhouse emissions by 25 per cent between 2020-2030¹⁴. One key area identified for climate mitigation is better livestock management with a view to enhance dairy farmer incomes and productivity in a way that builds climate resilience and reduces emissions.
- ▶ In response to the risks associated with principally exporting to one country (Kenya), the Ugandan government recently concluded a dairy deal worth USD 500 million per year with Algeria, equating to a volume of 1.4 billion litres of milk.¹⁵

Ongoing donor-funded initiatives

The dairy sector has a range of ongoing initiatives, which have different levels of maturity, focus areas and geographical coverage. Given the level of activity, it is important to map other project activities to better understand where Trade for Jobs could position its work in either complementing ongoing work or finding niche areas that not covered by other projects.

- ▶ The Inclusive Dairy Enterprise (TIDE) project was implemented by SNV in Southwestern Uganda with a goal of improving incomes for 20,000 dairy farmers. The TIDE project ended, and has been succeeded by the SNV INCLUDE – a USD 17.2 million project that works broadly in the livestock sector, of which about 20 per cent is focused on the dairy sector. It largely focuses on farmer productivity enhancement, cooperative capacity, digitalisation and farm management, and nutrition and extension services.
- ▶ IFAD is set to start a new six-year, USD 150 million regional programme called Dairy Interventions for Mitigation and Adaptation (DaIMA), aimed at mitigating the sector's impact on the climate.
- ▶ Ripple Effect and Heifer International work on capacity building of dairy cooperatives, integrating women and youth through value addition initiatives and climate smart initiatives.
- ▶ The International Finance Corporation (IFC) reportedly loaned Pearl Dairy USD 75 million in capital¹⁶ for two factory constructions, adding 400 thousand litres of processing capacity per day.
- ▶ IKEA Foundation has funded solar milk coolers among other climate focused interventions.

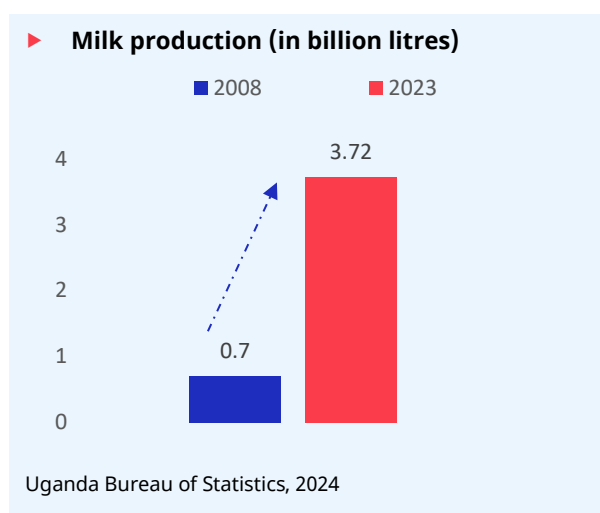
¹⁴ *Updated Nationally Determined Contribution (NDC)*. Ministry of Water and Environment. September 2022.

¹⁵ *Dairy Industry in Uganda 2022-2023*.

¹⁶ A national dairy company that runs the second-largest milk processing plant in Uganda, with a capacity of 240,000 litres of milk per day, producing mainly milk powder and butter oil.

2.2. Production and trade trends

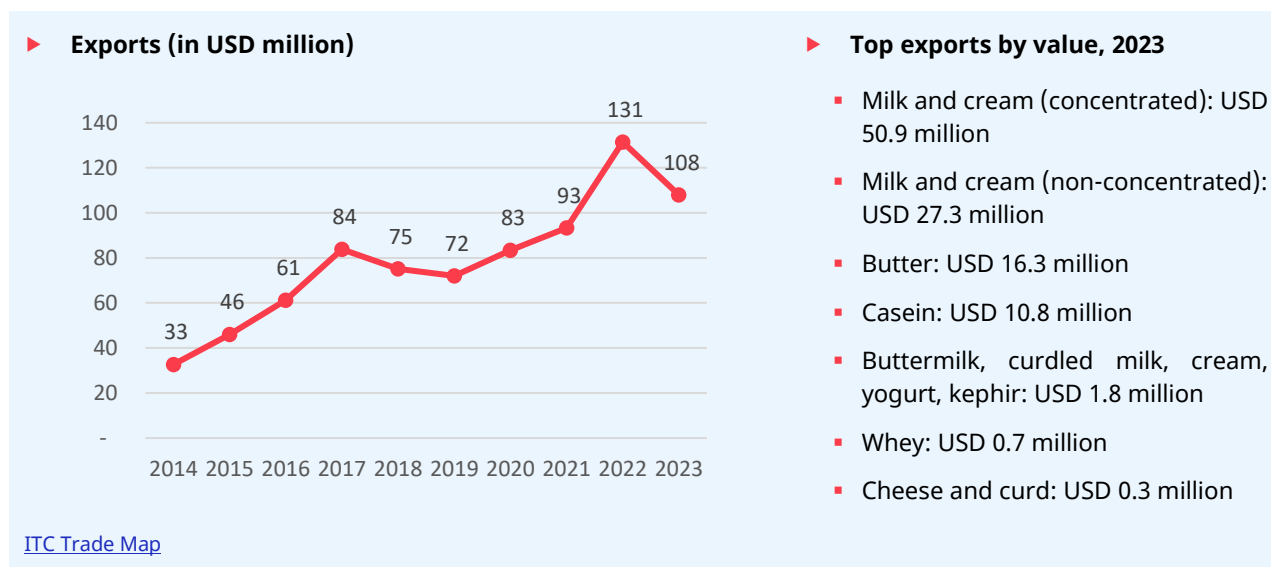
Uganda's milk production has been on the rise with a five-fold increase in milk production over the past 15 years (see figure).¹⁷ This has largely been attributed to the adoption of better production practices, including the use of better breeds and an increase in the number of milk collection centres run by companies, private owners, processors and cooperatives.¹⁸



The southwestern part of the country has emerged as a prominent milk production and processing region due to large investments in infrastructure, farmer sensitisation to transition from nomadic to commercial production practices, and breeding and milk handling practices. According to a livestock survey, the Western region accounted for the highest percentage of Uganda's milk production at 40 per cent, followed by the Central region (34 per cent).¹⁹

Dairy and dairy-based product exports, which are mostly destined for East African markets, have expanded rapidly during the last decade, totalling USD 131 million in 2022.²⁰ Exports are largely to neighbouring African countries for several reasons. First, the low value per volume of liquid milk makes Uganda uncompetitive for

further export market destinations as the transport costs become too significant relative to the milk's value. This has pushed a focus on higher value dairy products for markets located further away. Second, a preferential trade agreement between East African Community (EAC) members levies a 60 per cent value-added tariff on dairy imports from outside the EAC, giving Ugandan dairy a considerable advantage vis-à-vis countries located outside the EAC.²¹



¹⁷ *Theory of change for the dairy value chain in Uganda, developed for the CGIAR Initiative Sustainable Animal Productivity for Livelihoods, Nutrition and Gender Inclusion.*

¹⁸ *Dairy Industry in Uganda 2022-2023.*

¹⁹ Uganda Bureau of Statistics (UBOS) 2021

²⁰ International Trade Centre: [ITC Trade Map](#)

²¹ Abdulsamad, Ajmal and Gereff, Gary. February 2017. *Dairy value chains in East Africa*. Policy Brief. International Growth Centre.

This is shown in the concentration of product exports, particularly to EAC markets. In 2023, Uganda sent nearly 90 per cent concentrated milk and 60 per cent non-concentrated milk to Kenya – its two highest value exports. Beyond this, Uganda exported 70 per cent of its butter to Egypt, nearly 90 per cent of its buttermilk to South Sudan, and more than 85 per cent of its casein to the United States.²²

While Uganda exports to a wide array of countries outside of Africa (Japan, UAE, the United States, India and the UK), a small fraction of total exports end-up in these markets²³.

2.3. The target group and employment

The target group – women, youth and the poor – are positioned throughout the value chain in a range of activities.

At the **production level**, rural smallholder farmers contribute 95 per cent of the national production volume and 90 per cent of the nationwide herd. Small-scale production is largely a collective work of the family; however, males have ownership of the land and cattle. While tasks are largely shared, men reportedly work more actively in the sector, and particularly in labour-intensive tasks such as handling, milking and herding the cattle. Women more commonly work on local-level processing of ghee and butter. While tasks are commonly divided between men and women, most women do not market or sell milk and thus men commonly receive the payments and have financial agency.

Dairy producers, on average, reportedly earn more than most small-scale agriculture-based workers. While incomes at production level vary depending on a range of factors such as herd size, breeds and production practices, smallholder farmers reportedly earn between UGX 500 thousand to UGX 1 million per month.

Dairy farmer income streams are more stable as compared to seasonal crop farmers. While they do experience seasonality of incomes – farmers earn less during the dry season – they are typically paid twice per month rather than just once per season as is common in crop production. This can help families better manage household expenses. This allows dairy farmers to reinvest savings into incremental improvements, such as increasing herd size, which builds wealth.

In relation to other **job quality aspects**, dairy farmers have several occupational safety and health (OSH) risks. The first risk arises from not having any formal structure to fix a cow's position during milking. As one expert put it, dairy farmers have to wrestle cows to milk them. The second OSH risk arises from constantly spraying cows for tick-borne illnesses, which exposes farmers to hazardous chemicals.

For **youth**, some stakeholders indicated that youth are regularly trained in production practices but that there was a high turnover rate as youth migrated to cities to look for better paid work instead of applying skills or continuing work on the farm.

Throughout the chain, ownership and management is male dominated. **Cooperatives** and **milk collection centres** that are often cooperatives are male dominated, as they typically work with the marketing and sale of milk. Observation at several medium- to large-scale **processors** indicated that management and supervisory positions tend to be male dominated, however, lower skilled positions have a relative balance in gender.

For lower skilled positions at processors, workers typically earn around UGS 500 thousand per month and occupational safety and health prevention and safety procedures seem to be at a high standard, particularly at larger scale processors.

²² International Trade Centre: [ITC Trade Map](#)

²³ Nkuingoua Nana, J.C., Pernechele, V., Meilland, T., Munyuka Ariong, R. & Otikal, K. 2022. Analysing milk price incentives to strengthen policies for dairy production and exports in Uganda. Technical note. Monitoring and Analysing Food and Agriculture Policies (MAFAP). Rome, FAO. <https://doi.org/10.4060/cc3804en>.

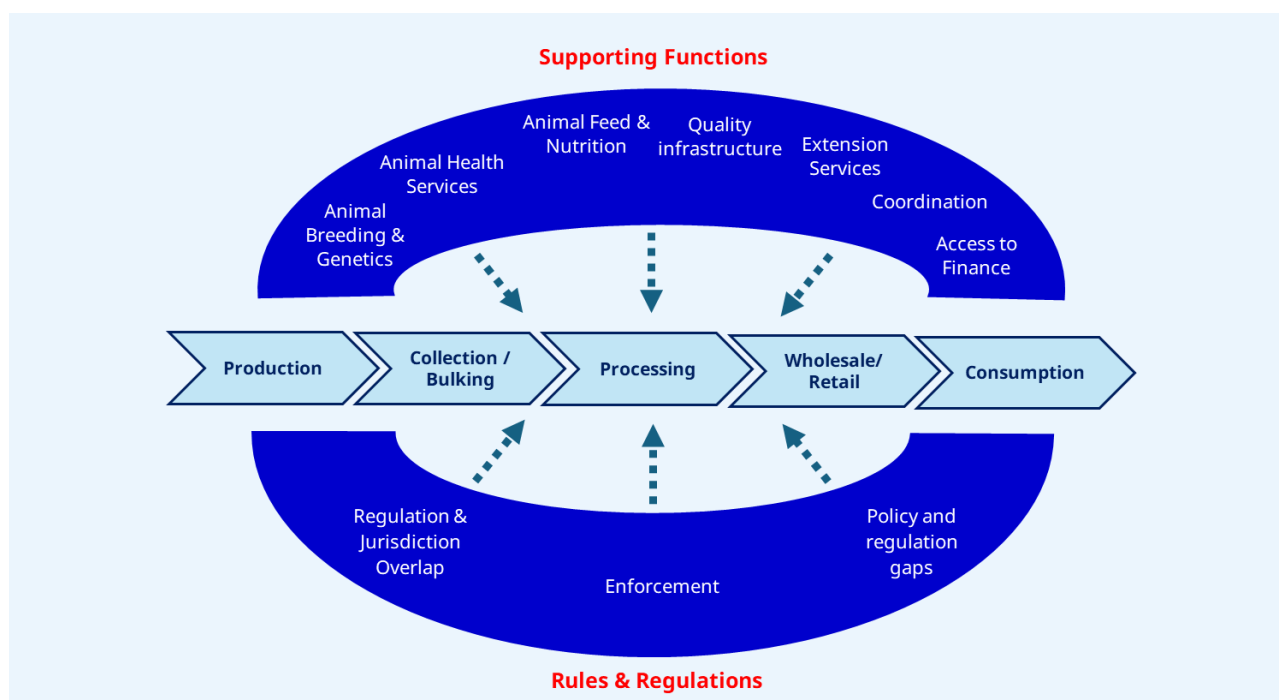
3. The market system

The market system is the overall picture of how a sector operates. The market system includes the supply-demand transactions in the core value chain - from producer to processor to end consumer - and the 'supporting functions' and 'rules and regulations' that shape the way in which businesses and employees work in this core chain. The market system, therefore, takes a broader scope because the export potential and commercial success of different actors in the value chain as well as the employment of the target group are influenced by what happens in their surroundings. For example, access to financial services, which is a supporting function, does not directly operate within the dairy value chain, but strongly influences how businesses set-up, grow and operate.

The figure below shows an illustrative market system for the dairy sector in Uganda, which includes a **simplified value chain** surrounded by the **supporting functions** and **rules and regulations**, which strongly influence and constrain market performance. Going forward, the analysis (Section 3) and opportunities (Section 4) sharpen the focus on women, youth and the poor - the project's target group - with a view to enhancing trade.

This dairy market systems analysis includes **two distinct geographies**. The **Southwest region** in and around Ankole is a highly developed dairy region with a thicker concentration of ecosystem actors, particularly milk collection centres and processors that engage more directly with producers. Dairy production in **Northeast** and **Northern** regions is much more nascent, and the concentration of dairy actors is comparatively very thin. While the context and constraints differ across the two geographies, they have been analysed together with the differences highlighted throughout the analysis.

► Market system of the dairy sector

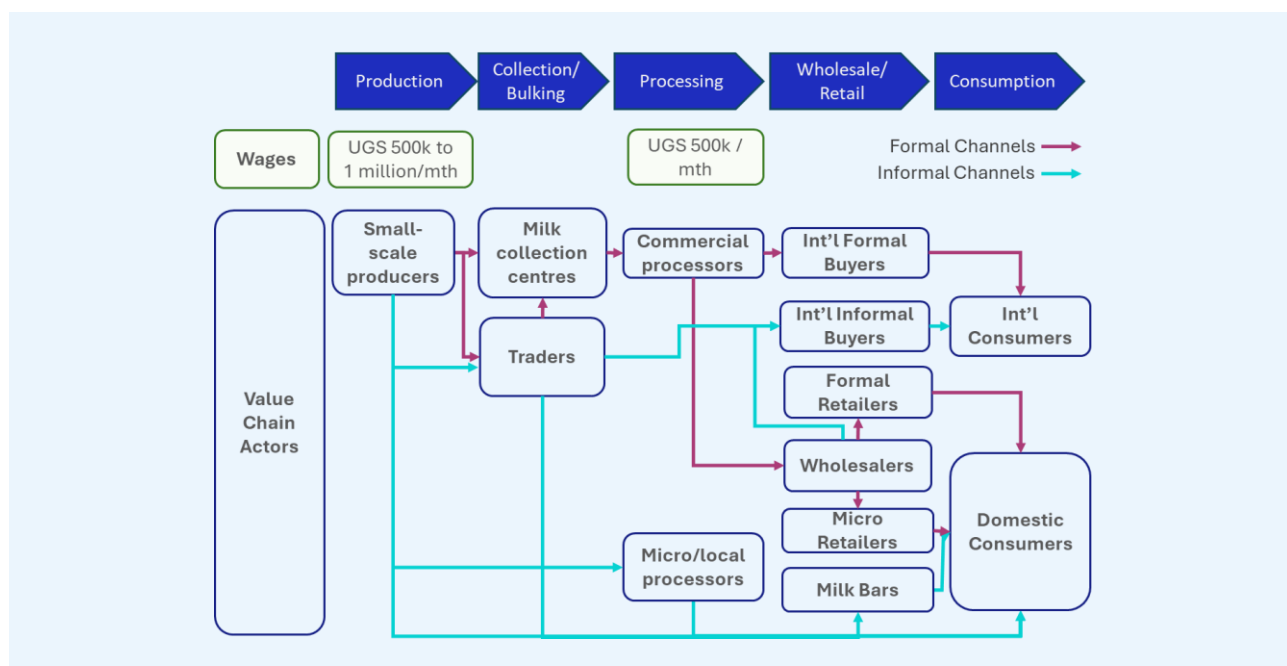


3.1. Core market

This analysis will first look at the core value chain, looking at the key issues from production to end consumers. The figure below provides a more comprehensive picture of the dairy value chain, showing the predominant channels, both formal and informal, in which dairy is sold until it reaches consumers.

In highlighting the various channels, about 20 per cent of milk production is consumed at the local/producer level, close to half is informally traded, and about one-third is traded in the formal market with processed products like pasteurized milk, UHT, butter and casein²⁴.

► Value chain of the dairy sector



Production

The **production level is where most of the target group is present**. Thus, if small-scale production can become more productive and produce better quality milk, the target group, mainly small-scale producers in this case, can generate more income. Productivity increases, and quality improvements can also benefit trade as underutilised processors will have access to more and better-quality milk. Thus, unpacking the constraints to production is key to building up production and trade.

The **gap between current and desirable productivity is substantial**. On average, national production yields are 5.0 litres per cow per day²⁵, whereas processors and specialists indicated that desirable yields are three to four times higher and max yields are eight times higher.

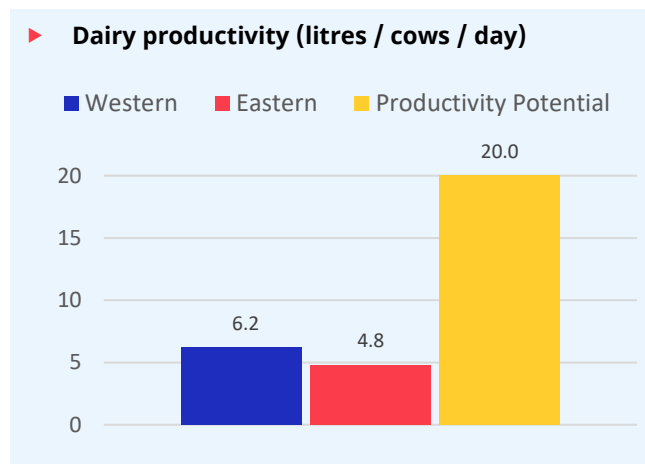
Production practices in the regions explored for this study are quite different. In the Southwest and Northeast regions, most cattle graze on grassland, which keeps input costs low. In the Eastern (Elgon) region, grasslands are less abundant, and cattle are raised intensively and fed on fodder. The Western region also has higher adoption of exotic breeds, which has contributed to its better yields.

²⁴ Nkuingoua et al. (2022)

²⁵ Dairy Development Authority Annual Report 2022-2023. (2024).

For farmers who rely on grazing, **production** volumes drop significantly during the dry seasons due to shortages of water and fodder. This negatively impacts farmer earnings and processors who can struggle to meet customer demands and maintain continuous trade links.

Due to availability of grasslands and a more professionalised nature of the sector, productivity in the Western region is about 30 per cent higher than that in the Eastern Region (see figure).²⁶ This indicates that while both regions still have lower than desirable productivity, the Eastern region has a bigger yield gap to make up.



Prices vary significantly and depend on seasonality, who the milk is sold to, and where the milk is produced. In the Southwest region, farm gate prices vary range from UGX 1200 per litre during the dry season to UGX 500 per litre during wet season. Farm gate prices in the Eastern and Northern regions have little seasonality and reportedly do not go below 1,000 UGX at any point during the year.

Relative to sales, rural consumers informally purchase directly from farmers and reportedly pay 100 per cent to 150 per cent more than MCCs. Rural consumers also pay daily instead of twice monthly by MCCs. While this provides a considerable incentive to sell locally and informally, the steady larger market from MCCs, and in turn processors, is still attractive.

Relative to geography, typical prices at the farmgate in the Northern and Northeast regions, are reportedly about 35 per cent to 40 per cent higher than in the more developed Western Region. This is attributed to the relative absence of supply that pushes prices higher in the Northern and Northeast regions.

Key constraints to production:

The below provides an overview of key constraints to production. Note that each constraint is unpacked further, mainly in section 3.2.

- **Access to and knowledge of quality animal breeds:** Farmers depend on low milk yielding indigenous breeds (Zebu, Ankole) instead of higher yield exotic or crossbreeds.
- **Animal health services and management:** Endemic diseases such as tickborne illnesses and foot and mouth disease cause high levels of animal mortality as well as reduce productivity as cows spend energy fighting disease instead of producing milk. One estimate suggests that tick-borne illnesses cause 30 per cent of calves to die and incurs USD 187 million of annual losses in milk production²⁷.
- **Adoption of nutrition and feed:** While nutrition and feed access during the rainy season is generally sufficient, farmers have not adopted the use of supplementary feed such as hay or silage, which reduces productivity and earnings during the dry season. This is becoming more important as climate change has reportedly elongated the dry season, acutely reducing cattle access to water and fodder, and in some cases incurring deaths.
- **Quality extension services:** Dairy production is a science. Developing an understanding of breeding, farm management, appropriate grazing, water access, hygiene and sanitation etc. requires a wide range of skills attained through training. However, the extension services that typically build the capacity of farmers are generally lacking and largely privately driven with little oversight or quality control.

²⁶ Dairy Development Authority Annual Report 2022-2023. (2024)

²⁷ Paul D. Kasaija, Agustín Estrada-Peña, Marinela Contreras, Halid Kirunda, José de la Fuente, *Cattle ticks and tick-borne diseases: a review of Uganda's situation*, Ticks and Tick-borne Diseases, Volume 12, Issue 5, (2021).

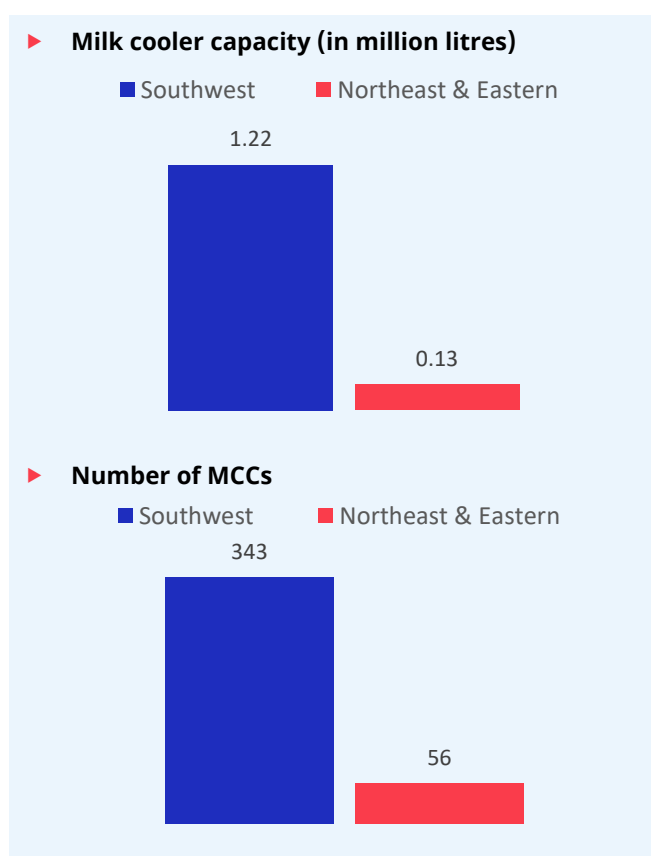
- **Gender norms:** Several factors limit women's participation in production. Ownership over land and cattle have culturally been male dominated, reducing women's access to these two key production resources. As they are also engaged in household care activity, they can also have limited time to commit to labour intensive activities.

Collection and bulking

Milk collection and bulking is a critical stage in the value chain which has a significant impact on the quantity of dairy products exported and the prices earned. At this stage, milk collection centres (MCCs) are the most prominent actors, providing an important aggregation and sales function and a first point of call on quality management.

Over 80 per cent of all post-harvest losses occur during the collection and bulking process, causing losses to an estimated 21 per cent of all milk produced.²⁸ At this stage, milk of varying quality is reportedly mixed together at MCCs, providing little incentive for farmers to produce better quality. This affects the amount and quality of milk that processors can export as well as the prices that farmers get for production.

MCCs are generally located between 10-30 kilometres from their dairy farm suppliers and receive morning deliveries of milk via motorbikes.²⁹ Deliveries come from farmers who sell directly to MCCs or alternatively, to transporters, who charge UGX 100 per litre transport fee and then sell directly to MCCs. Some of these transporters sell onward to the informal market.



Most MCCs are organised as formal cooperatives with members supplying milk to the cooperative MCC. Most are small-scale operations, employing 2-4 people, with good women's representation. While most MCCs operate as standalone facilities, some MCC cooperatives are collocated with adjacent services relevant for farmers. These include savings and credit cooperatives (SACCOs), veterinary drug and input outlets, fodder planting outlets, extension services and sometimes artificial insemination technicians.

The distribution of MCCs remains unbalanced. For example, the Southwest region has close to half of Uganda's MCCs and about 45 per cent of the MCC storage capacity, while the Northeast and Eastern regions have comparatively fewer MCCs (see figures).³⁰ Discussions with the DDA indicated that they were rehabilitating several MCCs throughout the Eastern region that will remain government-owned and largely cooperative-run, leasing premises from the government.

Functionally, MCCs generally operate with low margins and high losses, and lack management and negotiation skills. They reportedly have a profit margin

of around 5 per cent or less while 70 per cent of collection centre operating costs are related to milk purchases³¹. Given low margins and high risks, MCCs find it difficult to invest in upgrades and have, to some extent, become

²⁸ Dairy Policy Action Plan: Enhancing the performance of Uganda's dairy value chain. Dairy Development Authority. August 2022.

²⁹ Nkuingoua et al. (2022)

³⁰ Data and graphs to the right calculated from: *Dairy Development Authority Annual Report 2022-2023*. (2024)

³¹ Nkuingoua et al. (2022)

reliant on government and development partners for support and growth. While cooperative-based MCCs strengthen the position of dairy farmers by selling more product which can bring more negotiating power, they are still considered price-takers during negotiations.³²

Key constraints to collection and bulking:

- ▶ **Testing equipment and technical know-how.** As a result of donor and government funded interventions, many MCCs have milk testing equipment in the southwest region. For those without testing equipment, farmers and transporters reportedly water down milk to enhance milk volume and sales, which can reduce quality in the best instance and at worst, lead to milk spoilage and broader contamination within milk coolers.
- ▶ **Equipment maintenance:** When cooling equipment has a technical issue, the few technicians competent in repairing and maintaining coolers are based in Kampala, which drives up maintenance costs.
- ▶ **Market access** in a timely fashion:³³ A slump in markets could cause post-harvest losses of the already received milk or additional milk supplies, especially when the coolers are filled.
- ▶ **Regulatory enforcement:** Stakeholders indicated that the DDA was relatively effective at policing the quality, periodically checking milk quality for both motorbike transporters and MCCs, thereby enhancing transporter and MCC compliance. However, these same stakeholders indicated that the DDA enforcement was still under-resourced and this it may vastly decline once it joins MAAIF.
- ▶ **Energy access:** MCCs are often located in rural areas with no connection to the national grid. These are dependent on costly sources of energy (such as, diesel generators) to run the coolers. This has rendered such MCCs unsustainable due to the high operational costs, which reportedly require development partner or cooperative member subsidies to remain operational.
- ▶ **Affordability of milk transportation containers:** Due to high cost of appropriate containers, transport to MCCs or coolers is sometimes done in inappropriate equipment such as plastic jerry cans. This increases the risk of milk contamination.
- ▶ **MCC organisational capacity:** In the Southwest region, MCCs are price takers, and have little to no negotiating power over processors due to a lack of organisation capacity and limited market options especially during the peak seasons.

We spend on average over UGS 1 million per month on electricity bills to run the cooler.

▶ Chairperson at cooperative MCC

Processing

Milk processing has many positive impacts on trade and workers. It is key to enhancing the shelf life of dairy products - some ultra-high temperature (UHT) dairy products can last between six months and two years. It can provide a regular and stable market for farmers, add product value, create new jobs in processing factories, and is required for formal exports. As only 40 per cent of milk produced in Uganda is processed, potential scope to enhance processing exists.

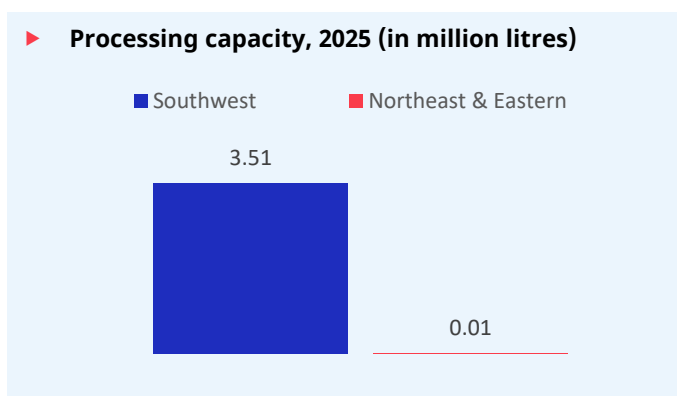
Currently, processing is done at various levels including on farm, at small-scale cottage facilities, and at medium-scale and large-scale processing facilities. It is processed into a range of products including yoghurt, cheese, butter, ghee, whole milk powder, pasteurised milk and flavoured milk products.

³² Nkuingoua et al. (2022)

³³ Dairy Development Authority 2022.

Medium and larger-scale processing can be characterised as somewhat underutilised, and at the same time, in the middle of a period of exceptional growth. Aggregate processing utilisation in Uganda is just under 70 per cent.³⁴ However, considerable investment has been made to enhance processing capacity, principally with two processing facilities in the southwest that will add 40 per cent to the national processing capacity. Beni Foods has just completed construction of a new processing facility in Lyantonde with a capacity of 1 million litres per day, while Pearl Dairy (Uganda’s largest processor) is expanding its capacity by 0.4 million litres per day. These developments will centre about three-quarters of the national processing capacity in the Southwest region.³⁵ By comparison, the Northeastern and Eastern regions have less than 6.5 thousand litres of processing capacity per day.

In light of this processing capacity imbalance, the DDA is in the process of renovating the Mbale milk processing factory as means to catalysing dairy growth in the Eastern region³⁶. While it has a potential installed capacity of 1 million litres per day, it has been sitting idle for approximately 30 years since the agriculture sector was liberalised and requires significant investment to become operational. The DDA has proposed that its upgrades be done through a public-private partnership. However, its estimated completion timeline is still unclear.



While investment into processing capacity should provide a “pull” toward a more formal dairy market and more product exports, the impact of such growth is unclear. To start with, the installed processing capacity in the Eastern, Central and Southwest regions will largely outstrip the available MCC supply capacity and thus collection and bulking infrastructure could become a considerable bottleneck. For example, **in the Southwest, the processing capacity will be about three times larger than the cooling capacity**. Secondly, these considerable processing investments may affect market and pricing. For example, Pearl Dairy and Beni Foods will have about 60 per cent of the processing capacity in the Southwest and about 45 per cent nationally. This concentrates market power in the hands of two processors, which may result in price reductions at the farm gate or consolidation of other processors – the latter of which appears to be already underway.

Larger processors also create employment, including for women, who are well represented in factories. For example, Pearl Dairy employs over 1200 people and Beni Foods employs 70, a number that will grow alongside production.

Processors at the **cottage industry** informally produce butter and ghee, typically by women, and sell finished products in the community or on the roadside. As per regulations, all processing facilities are subject to DDA regulation and licencing. However, many small-scale cottage facilities do not conform to this requirement and operate outside of requirements.

Several milk processing equipment suppliers are active in Uganda. TetraPak, a Swedish company, is a supplier of high-end processing technology and equipment as well as packaging materials to a small handful of large processors. Most of the equipment suppliers are based in the greater Kampala area, with some operating regional centres in the Southwest.

Key constraints to processing:

³⁴ Dairy Development Authority Annual Report 2022-2023. (2024)

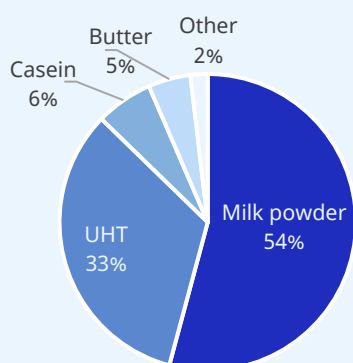
³⁵ Calculations here and in the graph to the right based on DDA figures and estimated additional capacity indicated from stakeholders

³⁶ DDA annual report 2022-2023

- ▶ **Enforcement:** Small scale/cottage processing is largely unregulated. The DDA lacks capacity to regulate them effectively, which keeps quality low.
- ▶ **Equipment and machinery:** Access to standard milk processing equipment for small-scale processors and cooperatives is low. This provides a large entry barrier to processing as it requires substantial investment to start commercial processing activities. Some processors reported a shortage of competent technicians to install, repair and maintain advanced milk processing equipment, relying on costly service providers from South Africa, India, Kenya and other sources.
- ▶ **Milk supply and supply infrastructure:** Most processors are not able to receive sufficient milk supply to meet the installed capacity of their processing equipment. This is even more pronounced in the dry season when milk production generally falls and increases operating costs as they are running sub-optimally. This could become even more pronounced with major processing capacity increases that will far outstrip any cold storage or production increases.
- ▶ **Coordination:** The Uganda Dairy Processors Association (UDPA) is reportedly weak, and only represents a few of the largest processors. This limits processors, and in particular SMEs, and their ability to enhance the sector and advocate for effective enforcement and regulation.
- ▶ **Cost of electricity:** Small scale processors and cottage industries pay twice as much per unit of electricity than large scale processors, which renders them relatively uncompetitive.

Wholesale / retail (including export)

▶ Export products by value, 2022-23



The two principal channels, domestic and international, each have formal and informal markets. Relative to the **domestic channel**, commercial processors of all sizes typically sell to wholesalers who sell to supermarkets or micro-retailers who then sell onto consumers. Relative to the informal market, producers sell directly to consumers or to milk coolers, milk bars or micro-scale processors who sell directly to consumers.

In looking at the **export channel**, several large-scale processors **formally** sell a range of products direct to international buyers, mainly skimmed and whole milk powder and UHT (see figure³⁷) and to a far lesser extent casein, butter, yoghurt, ghee and whey. **Medium-scale processors indicated that they are focused on**

the domestic market until they can further grow to where they feel it is more viable to enter international markets.

Informal exports are comparatively minor and reportedly occur when wholesalers try to move dairy products near or after their expiration dates through the relatively porous borders at Busia and Mutukula. One stakeholder indicated that the quality of these products is poor, and thus has affected the perception of Uganda's dairy products in regional markets.

Given that **the vast majority of exported dairy products are sold formally** and that it will be difficult for a project to reduce informal exports, the remainder of this analysis focuses on formal exports.

³⁷ DDA annual report 2022-2023

Despite being a landlocked country, a considerable disadvantage for exports to distant markets, Ugandan milk and milk products are reportedly very competitive on price. This has helped facilitate foreign direct investment at a range of major processors and animal genetics companies as well as make it possible to export dairy products to a wide array of countries.



Uganda has the lowest production costs for milk, which makes its milk competitive and thus attracts investments.

► Development actor

Relative to destination markets, the risks and consequences of relying on one market i.e., Kenya have led to widespread recognition that the sector needs to diversify export destinations. This has been demonstrated by reported export growth to the DRC, Namibia, Rwanda, South Sudan, USA, Japan, and the Middle East.

Government has been effective at negotiating preferential market access opportunities for dairy products. As a result, Uganda has free market access for its dairy products into the EAC, which has driven export growth. Government has also negotiated a deal with the Algerian market – worth USD 500 Million annually – and is reportedly under negotiations for a major deal with Nigeria. Exports to these and other overseas markets is primarily for powdered milk and casein given their comparatively high value relative to the distance to the market.

A range of public and private trade support organisations lead export facilitation including:

- The Uganda Export Promotion Board (UEPB) on export market research, penetration and promotion.
- The Uganda Revenue Authority/Customs on issuing preferential certificates of origin.
- The Uganda Chamber of Commerce and Industry on issuing non preferential certificates of origin.
- The President's Advisory Committee on Exports and Industry Development (PACEID) on organising trade missions and supporting market agreements.
- The Ministry of Trade, Industry and Cooperatives on trade negotiations, trade attaches.
- The Ministry of East African Affairs to set-up and oversee rules of engagement in the EAC market and resolve trade barriers.
- The Ministry of Foreign Affairs on dispute resolution in export markets and promoting market access.

Key constraints to exports:

- **Regulatory agency jurisdiction:** Export functions and procedures are covered by a range of government agencies such as MAAIF, DDA, UNBS and customs and border control. Each agency has a range of permissions and procedures that need to be attained prior to export. While large-scale processors did not find these difficult to comply with as they are well resourced, this can be overwhelming for smaller-scale processors and limit their ability to enter the export market.
- **Duplication of trade facilitation roles:** The public and private bodies that support trade facilitation and marketing such as UEPB, PACEID, Ministry of Foreign Affairs and trade attachés duplicate and overlap roles, limiting efficient use of limited resources.
- **Trade support institutions** such as the UEPB have limited human and financial resources to promote export growth and diversification of the sector. The private sector is largely left on its own to invest in costly market research and export market development activities.



One prominent processor has not exported to Kenya for a whole year due to geopolitical reasons.

► Border official

- **Non-tariff barriers and technical barriers to trade:** Importing countries, especially in the EAC and COMESA regions, often impose barriers on Ugandan milk exports. This is due in part to geopolitics and protectionist tendencies for domestic milk processors in the

importing countries. For example, the Algerian Bureau of Standards requires additional tests for heavy metals, which can be performed in Uganda, but impose additional requirements on potential exporters to conform.

- ▶ **Logistical costs** due to the need for extended road transport, high transport costs reduce the export viability for lower value products.
- ▶ **Lack of quality, accredited testing infrastructure** causes export delays and incurs costs. Borders do not have accredited laboratory testing infrastructure to test sample export consignments and thus, these samples have to be taken to a laboratory in Kampala for testing.

Consumers

Healthy, stable future product demand – both domestic and international – is essential for sector development and growth, and in turn, export and job growth. Strong demand maintains prices and gives stability to the sector while providing justification for investment into production and processing.

Relative to domestic demand, Ugandan annual milk consumption is less than a third of WHO's recommended 200 litres per capita per year. Various stakeholders indicated that **consumption is low as Uganda has not had a culture of milk consumption**, perhaps due to the sector's comparatively small size less than a generation ago.

In response to this, the Government of Uganda has collaborated with development partners and processors to pilot a **school milk feeding programme** which has so far reached over 1 million children in the Southwestern and Central regions. This campaign, if adopted and scaled, would increase domestic consumption significantly as there are currently over 10 million students in Uganda. It may also increase demand for formal milk with value addition – for example, UHT milk or powdered milk, which can be procured and distributed by government or the schools.

Relative to international demand, global per capita milk consumption for milk has been growing over the past decades. Supporting this, ITC's Export Potential Map indicates that **close to 60 per cent of Uganda's export potential remains unrealized**, a scope for increasing exports of dairy products further by USD 136 million.³⁸ This can be due to growth in the neighbouring EAC and Africa at large which have rising populations, incomes, and urbanisation as well as low existing consumption levels. For example, consumption in Kenya, Uganda's largest export destination, has grown 5.8 per cent annually.³⁹

Key constraints to demand:

Given that the project can do little to influence international demand, the constraints focus on those that could perhaps be impacted by a project in Uganda.

- ▶ **Government support for demand activation:** While the Ugandan government has funded a few short-lived milk consumption campaigns driven mainly by donor projects, their impact has been limited as government has not prioritised milk consumption as much as it has promoted production and export. The promotion campaigns are, therefore, scattered, uncoordinated and poorly resourced.
- ▶ **Government policies on school feeding:** The head of state has repeatedly objected to school levies for school meals in public schools. This has rendered it difficult to promote sustainable milk school feeding programmes that involve contribution from parents.
- ▶ **Culture of milk consumption:** The low levels of milk consumption are due to a history of limited availability of milk products to vast parts of the country.

³⁸ International Trade Centre: [ITC Export Potential Map](#)

³⁹ Kenyan Dairy Board

3.2. Supporting functions

Animal breeding and genetics

Good animal genetics provide a foundation for farmers to embed good farm management practices for improved production and productivity. Stakeholders indicated that the use of exotic breeds and better management practices can improve farmer milk productivity by 200-300 per cent. AI and embryo transfer technologies are more cost-effective at improving herd genetics than keeping bulls on the farms. Switching to exotic breeds can also reduce carbon emissions by 22 per cent per cow.⁴⁰

While a switch to exotic breeds may seem sensible, it is difficult to execute in practice. To start with, farmers see a number of benefits from indigenous breeds. For example, Ankole cows reportedly produce milk with higher butter fat content, are less vulnerable to tick-borne illness than exotic breeds and have lower maintenance costs as they are more resistant to diseases and weather changes. Secondly, many Ugandan cattle farmers keep large quantities of **local cattle breeds as a symbol of wealth or high social standing**.

Despite these initial barriers, momentum seems to be gathering for more exotic breeds. Over a 10-year period, a study found the composition of improved breed cattle on dairy farms in the Southwest region had grown from 7 per cent in 2007 to 45 per cent in 2018.⁴¹

Through its National Animal Genetics Resources Centre and Data Bank (NAGRC&DB), the government has been running livestock genetic conservation and enhancement for over 20 years, and is now the majority source of animal genetics resources. It actively promotes this through 15 ranches, and its mandate to promote more productive breeds, conserve local breeds and promote animal production practices among others.



Right now, if I need 10-20 Aisha heifers, I can't get them.

► Key stakeholder

Beyond government, several private service providers, such as the American livestock genetics company URUS, are present in the Southwest region, and are working to promote access to exotic breeds by building up the capacity of cooperatives and providing embedded services directly to farmers.

However, the market is still nascent; availability is limited, and adoption has not been fully embraced.

Key constraints to animal breeding and genetics:

- **Farmer knowledge:** Awareness on the productivity benefits of exotic breeds as well as the management practices on how to keep them healthy and productive is limited. Part of this is rooted in cultural beliefs that favour indigenous breeds or that farmers take pride in keeping bulls on the farms rather than work through AI. Another element is that these breeds are unfamiliar, and may require different management practices. While the adoption of improved breeds is spreading in the Southwest and farmers may continuously enhance their familiarity and awareness of the benefits more clearly, their uptake in other parts (particularly the Eastern and Northeastern regions) is still low.
- **Cost:** It is both more costly for initial AI services and keeping improved breeds on farm compared to the indigenous ones. On the private market, one AI service can cost around UGX 100 thousand (unsexed) while a sexed AI with 95 per cent likelihood of being female costs three times that. In dairy farmer currency, a sexed AI costs about 300 litres of milk or about two months of production revenue per cow, which is a considerable up-front investment. This is exacerbated by the conception failure rates, which require repeating of the procedures

⁴⁰ Lukuyu, B.A., Nagujja, S.J., Wanyoike, F.N., Bahta, S.T. and Baltenweck, I. 2023. Pathways to Dairy Net Zero: Promoting Low Carbon and Climate Resilient Livestock Uganda-Market study. Presentation. Nairobi, Kenya: ILRI.

⁴¹ Bjorn Van Campenhout et al. (2021) *Leading the way – foreign direct investment and dairy value chain upgrading in Uganda* Wiley online library

and loss of calving and milking time. However, it is still cheaper than buying calves outright; an Anokole calf costs an estimated UGX 500 thousand to UGX 1 million.

- ▶ **Government resourcing:** Government ranches provide semen to farmers, and can do so at a cost-effective price of between UGX 3,000 to 5,000 shillings per straw (or dose). However, a lack of resourcing has slowed down wider roll-out and adoption to secure more supply or last mile distribution of semen.
- ▶ **Access to quality semen and liquid nitrogen:** Liquid nitrogen, which keeps semen in viable condition, is only available at three plants. Two of these are in the central region (Entebbe and Mpigi) and one in the southwest (Mbarara), adding significant transportation costs to AI in some regions.
- ▶ **Availability of AI technicians:** While government and development partners have trained and deployed some AI technicians, competent AI technicians still do not have sufficient coverage.

Animal health services

Stakeholders indicated that poor animal health has one of the largest impacts on the sector, having considerable impact on livestock mortality and health, which reduces productivity and quality of milk. Fewer and less productive cows reduce farmer incomes and the quantities of milk that can be processed and exported.

Poor animal health manifests itself in several ways. The most significant impact comes from tick-borne illnesses with considerable impacts on mortality, causing an estimated USD 1.1 billion in annual losses due to losses in milk and meat production.⁴² Food and mouth disease (FMD) is endemic to Uganda, and has caused significant impact due to frequent quarantines and trade restrictions.

To control diseases, some farmers spray or dip their herd, but over time, ticks become resistant to the acaricides. This leads to more application with higher concentrations, which further exacerbates the resistance. This increases farmer costs and exposure to chemicals, negatively affects biodiversity, and reduces farm productivity over time.⁴³

Government extension workers and a network of private veterinary professionals and paravets typically offer animal health advice, treatments and vaccines. The private extension workers are usually deployed by local NGOs, processors or, in some cases, hired by farmers. Others offer veterinary advisory services as a bundled service alongside the sale of drugs and other veterinary products at sales points.

Key constraints to animal health services:

- ▶ **Animal health is a complicated science.** Walk into a livestock inputs store and you will see a range of tablets, creams and sprays to apply under a variety of circumstances. It can be difficult to understand what to apply, and when and how. It is thus unreasonable to expect farmers, who have not had formal veterinary training, to understand how to use products effectively. This renders them dependent on trusting the advice of private operators who are in the business of selling products (see below).
- ▶ **Control and regulation of animal health products.** Some products sold at input dealers are counterfeit, which have limited benefit or, at times, can have negative impact on animal health and environment, and can contaminate milk. Their use can undermine farmer trust in products and further limit their use. This is largely due to ineffective regulatory control, standards and enforcement particularly for veterinary products sold and used at the farm level. Although the National Drug Authority (NDA) regulates and licences production, importation and distribution of veterinary drugs and products, they are under-resourced relative to growing demands. This means that many veterinary drug outlets operated by unqualified persons, dispense and prescribe counterfeit drugs and products erroneously. Furthermore, existing laws against counterfeits reportedly have weak punitive measures which limit deterrence. However, this is expected to be addressed in the draft Anti-Counterfeits Goods bill, likely to be passed by the parliament in mid-2025.

⁴² Paul D. Kasaija , Agustín Estrada-Peña , Marinela Contreras , Halid Kirunda , José de la Fuente. 2021, *Cattle ticks and tick borne diseases; a review of the situation in Uganda*

⁴³ [The bright future and hindering challenges of the dairy sector in Uganda - Agriterro](#)

- ▶ **Government spending and human resources.** The problems associated with animal health are well established and vast. However, the government has not dedicated appropriate resources to extension officers (see Extension Services sub-section), vaccine development or management of risks like FMD.
- ▶ **Data on impacts on mortality and productivity.** While district level veterinary offices collect some data on mortality, it is not done in a scientific manner or aggregated with other districts. This leads to a lack of clarity on the extent to which the problem persists, and the value that it extracts from the sector – which in turn may be a cause of under-investment to address the issue.
- ▶ **Focus on treatment rather than prevention.** While a range of vaccines exist for certain diseases, Uganda does not yet have a vaccine ready the tick-borne disease, its biggest concern. This pushes work towards disease treatment, which in many cases can be too little too late. While the Uganda National Agricultural Research Organisation (NARO) has made a breakthrough in the development of an anti-tick vaccine following years of research, it is currently undergoing the regulatory approval and registration process ahead of its mass production and use. The vaccine presents both a cost effective and ecologically friendly way to manage and control tick borne diseases, but it is unclear how and when this will get to market.

Animal feed and nutrition

Nutrition is important for dairy farmers as it impacts animal productivity and health. Animal feed can sustain more consistent production levels and incomes and even allow farmers to take advantage of higher prices during low season. It can help protect farmers against extended droughts, which can drastically reduce production for long periods and even cause deaths. Supplemental feeding can enhance milk supply to processors in low seasons and reduce the intensity of greenhouse gas emissions.

The way in which dairy farmers feed their cattle differs throughout the country. For example, most dairy farmers in the Southwest utilize grazing on open pasturelands, while some farmers in the Northern and Northeast regions still have nomadic practices. Population growth has reduced the area available for extensive grazing and in the Southwestern and Central regions, paddocking has been adopted to enable controlled grazing. In densely populated areas like Central, Elgon and Kigezi subregions, smallholder farmers practice zero grazing or tethering.

A study on major milk-producing areas revealed that 45 per cent of farmers feed their animals on natural pastures⁴⁴, and one in four farmers on cultivated pastures. However, as natural pastures often lack essential nutrients due to overgrazing, they can hinder productivity and well-being of livestock.

Only one in five farmers preserve forage in the form of hay or silage, despite its growing importance and that the DDA and development partners are promoting fodder production (e.g., hay, silage, and seeds).

Access to water is a significant challenge for dairy farmers across all milk sheds. Livestock often use energy to walk long distances to access water, which is insufficient, particularly during dry seasons. While wealthier farmers in the southwestern and central regions dig private dams, most smallholder farmers depend on rivers, wells, streams, and other potable water sources. Contaminated and communal water sources can also cause diseases.

Key constraints to animal feed and nutrition:

- ▶ **Farmer knowledge and awareness:** Limited awareness of the benefits of supplemental feeding and adequate water provision restricts the adoption of better feed practices and investments in water infrastructure. Farmers reportedly do not view feed production as a business or a part of their dairy production business. This is particularly acute for women producers who have lower access to information and networks.
- ▶ **Access to finance:** High costs of water systems and a lack of financing mechanisms prevent smallholder farmers from investing in essential infrastructure.
- ▶ **Cost and access to inputs and machinery:** Fodder seeds are scarce and thus costly for smallholders. Silage-making machinery is expensive and impractical relative to the land holding sizes for most small-scale farmers.

⁴⁴ Atwijukire, Benjamin. *Knowledge, attitudes and practices of dairy cattle feeding in selected districts of major milksheds of Uganda*. Makere University. 2023.

It would likely require a reasonable-sized business or cooperative to make such an investment and rent this out, but this has largely not been done to date.

- ▶ **Market distortion:** To date, the DDA and development actors have reportedly been providing fodder seeds to farmers without developing the seed market with a long-term strategy.

Quality infrastructure

Currently, a comprehensive set of milk quality parameters is not consistently measured and tracked at the MCC level. Many MCCs pool milk from numerous suppliers, which often mixes high- and low-quality milk together. This perpetuates uniform pricing and disincentivizes suppliers to adopt practices that enhance milk quality and undermines their ability to bargain for better prices.

Additionally, internationally accredited testing infrastructure helps certify that milk produced in Uganda meets the standards and requirements from importing countries. For example, before powdered milk goes to Algeria, it must pass tests that show it meets Algerian standards, which are not necessarily harmonised to Ugandan Standards. Accredited and recognised laboratories are located in Kampala, in a few regions and in some large-scale processors' facilities. However, access to labs for small-scale processors, who have no in-house laboratories, is both difficult and costly.



We started implementing a quality-based milk payment system. This has given MCCs an incentive to bring us good quality milk, which in turn benefits farmers.

- ▶ Large-scale processor

On the regulatory side, the DDA enforcement has provided incentives for MCCs to set milk quality standards. The DDA has well-equipped laboratories at their regional offices and two mobile laboratories stationed in the Southwest and Central regions, and conduct unannounced spot tests and surveillance audits of urban milk coolers to verify milk quality. This has reportedly created some change, but has been limited given DDA resourcing.

Other government offices have different testing responsibilities. The Uganda National Bureau of Standards (UNBS) has decentralised its laboratory testing infrastructure in the Northern, Southwest and Eastern regions, while MAAIF inspects dairy processing facilities through its regional laboratories which focus on running disease diagnostic tests that do not check for quality.

Key constraints to quality infrastructure:

- ▶ **Harmonisation of the testing services:** Different agencies have quality testing infrastructure but there is no coordination to share these resources or make them available for private sector usage.
- ▶ **Access to accredited quality testing infrastructure:** While some universities in both Eastern and Western regions have appropriate testing equipment that is sitting idle, they are not yet accredited for the parameters required in individual export markets. Additionally, it is costly to get accreditations for multiple markets and they have not developed a commercial case to see if such a testing service is marketable to smaller-scale processors.
- ▶ **Testing skills:** Processors reportedly can reject milk deliveries from MCCs due to a failure to conduct accurate tests or contamination/adulteration during transportation. While the DDA organised a few trainings here, it is unclear if that will continue and as such, there is no recurrent testing or training available for MCCs.

Extension services

Extension services can help farmers make decisions and change practices related to using exotic or cross breeds, more appropriate animal health practices and better feed and water uses. Such services can help farmers transition

from traditional to more commercial dairy production practices, bringing more income to farmers and good-quality production into processors for export trade.

Through MAAIF, the government provides extension services primarily focused on veterinary care, including animal vaccinations against epidemic diseases, quarantine enforcement, and fly control. However, these services are more reactive than preventive, as livestock vaccinations are typically conducted only during disease outbreaks. While these services are offered free of charge, clinical care, breeding, and tick control through spraying have been privatized and are now paid for by farmers.⁴⁵

Given the limited availability of government extension services, the void has been filled by a range of private paravets and processor-funded extension service officers, which have incomplete coverage. Nationally, about 4 in every 10 livestock-keeping households (including those involved in cattle) did not have access to extension services. In cases that farmers do have services, about 7 in 10 received private extension services from dairy processors, animal health officers or breeders, which have mixed quality⁴⁶.

The national agriculture extension policy provides for deployment of government extension workers at every subcounty unit. However, in practice, most districts are understaffed. For example, one district in the Southwest region has one animal health staff per every 170 livestock rearing households and spends about Ush 1,300 (USD 0.36) per household on such services⁴⁷. By comparison, one large-scale processor indicated that they typically had one extension officer covering about 20 to 30 farmers.

Thus, government offices in charge of extension services need to exercise some creativity. One district level veterinarian indicated that he had so few resources that his focus was to train certified private paravets to improve their services as they were reportedly less competent in disease diagnosis, advisory and treatment, often resulting in mortalities and morbidity. Another government breeder indicated that his strategy was to reach out directly to train heads of cooperatives, hoping that information filtered down to members. And another indicated that they had to charge farmers a small amount, such that they could extend the outreach of their services.

Key constraints to extension services:

- ▶ **Gender:** One government extension worker estimated that 90 per cent of trainers are men, causing a barrier for women to learn, progress and further engage in the sector.
- ▶ **Government resourcing:** Veterinary units are underfunded and understaffed, limiting their ability to provide more complete coverage, preventive actions and expand outside of veterinary services into breeding and nutrition. Resourcing also limits their ability to travel to rural farmers.
- ▶ **Regulation and standardisation of private (paravet) services.** The current regulatory framework for the veterinary profession does not issue competencies or supervision requirements for paravet practitioners. This means that both trained agriscience professionals and those who have little agriscience background or skill offer services as paravets without distinction between the two. To address this, the government passed the Veterinary Practitioners Act 2024, which established a veterinary council responsible for prescribing the training, qualification, licencing and regulation of paravets. However, this does not yet have regulations and is not enforced.
- ▶ **Training standardisation:** Institutions and development partners hold trainings to develop the capacity of paravets. Despite their good intentions, these trainings often do not use a standardised curricula or have any quality control mechanism. This means that a range of training qualities are offered, and private paravets do not have a standardised baseline or minimum service offer. While district and local governments should

⁴⁵ Arvidsson et al. (2022) *Diverging Discourses: Animal Health Challenges and Veterinary Care in Northern Uganda* Frontiers in veterinary science.

⁴⁶ Kiiza, Christopher, "UBOS Census: Western Uganda ranked highest milk producer". Chimp Reports. 7 April 2024.

⁴⁷ FAO. 2021. *Animal health services at work in Uganda – Evidence from Mukono and Wakiso districts*. Africa Sustainable Livestock 2050. Rome. <https://doi.org/10.4060/cb7103en>

regulate paravets and ensure that they hold the minimum allowable qualifications, are registered by the Uganda Veterinary Council, and operate under the supervision of qualified vets, most do not abide by this requirement.

- ▶ **Cost:** Veterinary clinical services are fully privatised whether delivered by public or private practitioners. Many smallholder farmers cannot afford veterinary clinical services which often include professional fees, transport, medicines and other sundries.

Coordination

The dairy sector is primarily coordinated by the DDA whose mandate is to coordinate production, processing and marketing activities of private and public sector actors. While stakeholders generally have a favourable view of the DDA's work to coordinate and regulate the sector, its shift back into the MAAIF may limit its abilities.

The government indicates that they find it difficult to coordinate with the private sector. This is because the sector lacks effective coordination bodies that cover the interests of a wider range of parties, particularly SMEs, or coordinate across the value chain.

While the Dairy Farmers Association, Uganda National Dairy Traders Association and Uganda Dairy Processors Association (UDPA) currently operate within Uganda, stakeholders generally perceived them as weak and indicated that they did not hold dialogue between one another. The UDPA only brings together the seven major dairy processors and is perceived as weak, lacking a formal management structure, secretariate and office.

Small producers can be organised into cooperatives, yet most smallholder dairy farmers are not. Some cooperatives are organised into a cooperative union, such as the Crane Creamery Dairy Union in Mbarara. However, it is unclear if these cooperative unions are effective in their advocacy toward the government.

Given the considerable and recent sectoral growth, the potential degradation in quality of the overall government sectoral coordination, and the weak and highly fragmented coverage of existing coordination bodies, a strong coordination function will be important for this project's objectives.

While there have been initiatives to create multi-stakeholder platforms in the sector, mainly championed by SNV (AgriProFocus) and UN FAO, they have not been sustainable because they were driven by projects with limited lifespan and perhaps have not had the sectoral momentum or need to develop such a function.

Constraints to sector coordination:

- ▶ **Collaboration incentives:** As the sector has been coordinated relatively effectively by the DDA, there has been little appetite for additional coordination among private actors. Further, competition has hindered actor incentives to coalesce around strong coordination bodies. This is perhaps why coordination platforms formed previously by NGOs and focused on a specific issue have not been sustainable and disband when the funding for convening stops.
- ▶ **Sector nascence:** As the sector has been comparatively small and less commercial until the last decade, it perhaps was too small to have as extensive a need for the coordination and advocacy.
- ▶ **Informality:** The large informal sector, much of which produces and sells raw milk at the local level, is not exposed to formal testing or rules and regulation and would perhaps benefit less from broader coordination.

Access to Finance

Dairy farmers require finance for investment into farming practice upgrades. This can be for larger investments into key farm infrastructure improvements, or for smaller incremental farm upgrades such as AI services and breeding, feed, feed machinery, veterinary services, labour, transportation and other related needs.

❏ Farmers supplying milk through MCCs get paid after 15 days of supply. This generally creates a liquidity difficulty for smallholder farmers who may need to attend to other needs such as veterinary services, feeds, transportation, and other household needs.

▶ Fintech provider

Despite the need, the market is largely underserved. In 2019, the agriculture sector received only 12 per cent of total formal credit, with only one third of this going to agriculture production.⁴⁸ Thus, smallholder farmers mostly rely on SACCOs and informal sources of financing that include village savings and loan associations (VSLAs), rotating savings and credit associations, informal market lenders, and buying goods and services on credit.⁴⁹

Financing at the production level comes through four formal sources:

- ▶ **SACCOs** form the bulk of formal agriculture lending facilities in Uganda, particularly in the dairy sector, where DDA actively promoted the integration of SACCOs at every dairy cooperative MCC. This strengthened the penetration of SACCOs in dairy producing areas, particularly for women, who do typically do not have collateral to access finance from formal financial institutions. However, SACCOs still face a range of challenges, including slow processing times, small loan facilities, poor data management, and poor management, and have relatively high minimum interest rates of 1.5 per cent per month (20 per cent annualised).
- ▶ **Digital platforms (fintech)** have gained traction in the dairy sector with several emerging platforms, products and services. These platforms aim to offer products that are collateral-free and linked to milk sales. They target farmers through cooperatives and provide short-term credit. In one example, PataSenta provides credit for 15 days to farmers who sell milk on their platform. This can cover advance payments for milk or inputs on credit. While these have eased credit to smallholder farmers, their business models have largely remained unproven and remain reliant on development partners. The interest rates of at a rate of 1 per cent to 3 per cent over the 15-day period (27 per cent to 104 per cent annualised) are also unfavourable.
- ▶ **Formal financial institutions** have developed products targeted at the agriculture sector. However, financing has been limited due to a range of supply and demand side constraints. On the demand side, smallholder farming is high risk (weather changes, diseases) and includes seasonal prices and production fluctuations, which makes planning and repayments difficult. Additionally, farmers who request small amounts of credit, have poor record-keeping, lack collateral (particularly youth and women) and are in remote and hard-to-reach areas, making financial services costly. On the supply side, financial service providers offer high costs of credit, lack tailored products to meet farmer needs, prioritise easier and more bankable sectors and have lengthy loan processing procedures.
- ▶ **Government** has rolled-out initiatives, such as the Uganda agriculture insurance scheme, the agriculture credit facility, a youth livelihoods programme (revolving fund), the Presidential Initiative on Wealth and Job Creation (Emyoga), and most recently the Parish Development model (PDM), among others. However, these programmes have had mixed results and provide very limited coverage for the sector.

A range of stakeholders indicated the “missing middle” as a key issue with access to finance. That is, large-scale processors can generally find foreign direct investment or financing for major upgrades and small-scale producers can access small amounts of credit through SACCOs or fintech platforms albeit at a high cost. However, the sector has limited financing for medium-sized investments, which can help farmers invest in infrastructure upgrades that can vastly improve productivity or MCCs to upgrade cooling infrastructure. This includes investments into pumping and channelling water to cows such that they spend less energy searching for water (USD 3,000) or for milking

⁴⁸ Unlocking Agriculture Finance and Insurance in Uganda: The Financial Sector's Role in Agricultural Transformation – Policy note 2019 Bank of Uganda

⁴⁹ https://fsduganda.or.ug/wp-content/uploads/2021/02/Blog_COVID-19-and-access-to-agricultural-finance-in-Uganda.pdf

stations where cows can be milked in a stationary manner, minimising farmer safety risks. While some of this may be due to demand side issues flagged above, it is unclear if the commercial viability of these types of upgrades have been proven.

3.3. Rules and Regulations

Regulatory jurisdiction and overlap

The dairy sector is regulated by various government ministries and agencies including MAAIF, DDA, UNBS, the Ministry of Trade Industry and Cooperatives (MTIC), and the Ministry of Local Government (MoLG), among others. The table below summarises key requirements at various stages of the value chain for regulatory compliance along the core functions of the dairy market system.

► Government regulators per value chain function

Core function	Regulator	Focus
Production	MAAIF and its agencies, MoLG extension staff	Farm inputs, breeds, nutrition, extension services (animal health, production and farm management practices)
Collection and Bulking	DDA, MTIC, MoLG	Cooperative registration, quality assurance, licencing of MCCs, transportation tankers
Processing	DDA, UNBS, MAAIF, MTIC, National Environment Management Authority (NEMA)	Quality and safety standards, fitness of facilities, public health concerns, environmental concerns
Marketing	DDA, UNBS, MTIC, MoLG	Quality and safety standards, market access regulation compliance, training and operation licencing

When looking specifically at one element of dairy production and processing i.e., the conformity to hygiene and quality standards, five major regulatory authorities have responsibility for developing and/or enforcing hygiene and quality standards (see Annex B).

Duplication of roles and poor coordination among agencies leads to regulatory fatigue, hinders private sector compliance and adds cost for businesses to grow and expand. The technical nature of standards and documentation poses challenges for SMEs, especially in downstream segments like MCCs and processors. Duplication of roles also has limited trade facilitation and marketing as it leads to a sub-optimal use of resources.

With the DDA recently being subsumed into MAAIF, some of DDA's previous functions could be streamlined or dispersed across the other agencies. However, it is unclear what will happen or if the existing agencies will have the capacity to take on these new functions.

Key constraints:

- **Coordination:** The absence of a vibrant private sector coordination body to proactively advocate for a better regulatory environment.
- **Outdated laws and lack of operationalised policies:** The government has a range of acts and laws which have been brought onboard over time, dating back to the 1960s, which encapsulate time periods that cover when the sector was largely nationalised, liberalised but small, growing considerably and commercialising. It is now entering a new phase with DDA being rationalised into the MAAIF. This means that the government set up laws when its functionality was quite different than how it operates at present. While there has been some push to update these laws and a series of relevant acts have or are in the process of being passed, these new acts have not yet translated into regulations which govern the sector (see Regulation gaps sub-section).

Enforcement

Government enforcement of regulations is important for sector development. It helps provide a baseline for practices and product quality – limiting poor practices like an MCC collecting more milk than its volume of cold storage. As one stakeholder indicated, people only comply when enforced to do so, and thus, regulations and standards can run hollow without proper enforcement.



The DDA has been the police of the sector.

► Cooperative manager

To date, the DDA has provided relatively strong sectoral enforcement. They do spot checks on transporters to ensure they use aluminum cans instead of plastic ones and check MCCs to ensure their quality testing and sanitation is up to standard. For noncompliant parties, they fine or close operations and sometimes even make arrests.

However, signs are showing that the quality of the DDA's enforcement has been waning. The number of inspections to milk premises has dropped by 17 per cent over the most recent four-year period, despite milk production increasing by over 50 per cent during the same time period.⁵⁰

Enforcement is expected to further decline with the DDA's absorption into the MAAIF. Here, several stakeholders expected a short period of zero enforcement while the DDA's roles and responsibilities are being defined, followed by a sustained period with little resourcing as the new DDA will now have more funding and resource competition within MAAIF.

Key constraints to enforcement:

- **Political interference:** Politicians can interfere with enforcement efforts. For instance, when MAAIF institutes quarantines to limit the spread of animal diseases, politicians have been reported to issue directives, which stopped quarantine and caused disease to spread to other regions.
- **Agency coordination:** Few agencies coordinate inspections and the results from those inspections are not hosted in a centralised repository. This limits the understanding that various agencies have of how compliant businesses are to other agency standards, which in turn limits their ability to target their limited resources to inspections on higher-risk businesses.
- **Process to change enforcement responsibilities:** While there is considerable enforcement overlap, changing enforcement responsibility requires Parliament to amend and approve an official act. This is a considerable task.

Regulation gaps

For the dairy sector to thrive, there is need for a supportive policy and regulatory environment. However, as it stands, the sector is constrained by old laws which have become outdated by changes in the context for which industry players have found difficult to understand and sometimes apply.

Government has seemingly recognised this, and has recently approved several acts which could update regulation. However, these laws have yet to be put into regulation and there is no clear timeline on when that will happen. This includes:

- The **Animal Diseases Act**, which provides the foundation for the country's disease prevention, response and management of disease outbreaks that impact production and trade in dairy products. This act was enacted in 1918 and was amended in 2006 to enhance penalties for offenders, but other key clauses that relate to animal disease management remain outdated.

⁵⁰ Calculated from DDA annual report 2022/23

- ▶ The recently enacted **Veterinary Practitioners Act**, which intends to enhance and standardise the quality of paravet services by streamlining their training, defining their roles and specifying supervision and licensing requirements. This intends to bring up a baseline standard to service providers and remove the threat of poor quality paravets who give bad advice to farmers on disease diagnosis and animal care services. However, the law does not have the regulations to operationalise it.
- ▶ Through the **Dairy Industry (Amendment) Act**, government subsumed the DDA into MAAIF, however, this also does not have a regulation to operationalise how DDA will function within MAAIF. This creates uncertainty on how to execute DDA functions which could potentially slow sector growth or cause standards and quality to diminish.
- ▶ The **Anti-Counterfeit Bill** is in process of parliamentary approval but may also suffer the same lag in having regulations drafted up and put into action.

Key constraints to enforcement:

- ▶ **Budgets:** While the Parliament appropriates the budget for Acts, they do not appropriate the budget for setting up regulations and operationalising them. Thus, many Acts are drafted into regulation and action by donor projects. Also, in the run up to the next election expected in January 2026, budget allocations are trimmed back and take some time to rebound, so putting these acts into regulation may take further time.
- ▶ **Competing priorities:** When MAAIF receives its budget allocation, it needs to cover a range of sectors, and priority seldom goes to developing of regulations to operationalise laws.
- ▶ **Communication of standards.** Some regulatory documents can be too technical for farmers, transporters, MCCs and smaller scale processors to understand and adhere to. For example, standards for milk quality and safety are so technical that they are better understood by agri-scientists than the intended audience. This limits their adoption and adherence.

4. Recommended intervention areas

In this project, a market systems approach will seek to address constraints to the broader system which inhibit trade, business performance and the creation of more and better jobs. By nature, projects using the market systems development approach pilot many different interventions, hoping that some gain traction and drive a larger systemic change. At the same time, some interventions may not make it to a point where they have significant impact (though they do no harm). The reason for this is that several factors, many of which are outside of programme control, determine the success or failure of a pilot intervention. This may include partner capacity and motivation, and/or market forces which affect prices and demand.

Once pilots are tested and have been demonstrated as effective for enhancing trade in the dairy sector or creating more or better jobs for women, youth/or the poor, the project should try to see how these approaches can be upscaled to have further impact.

► Facilitating market system interventions

Traditional value chain development projects tend to orient their interventions towards the question of *"What problems do value chains have and how can the project solve them?"* rather than focusing on *"Why isn't the market environment providing solutions to these?"* and *"How can the project address the constraints that prevent it from effectively doing so?"*

A market systems approach opts for a 'light touch' way of intervening, running a temporary package of activities designed to stimulate lasting behaviour change among public or private market players. The facilitation approach encourages market actors to take on new or improved roles which will lead to systemic change in the market system.

Anything is possible with facilitation: From 'hard' tactics like cost-sharing and technical advice, to 'softer' tactics like brokering relationships, as long as the facilitative interventions build toward a more efficient and inclusive system that enhances trade and creates employment impact for the target group beyond the life of the project.

4.1. Potential areas for intervention

Based on the analysis findings, several potential areas for interventions have been identified. These interventions are focused on addressing the underlying causes to key constraints. They also have a sustainability and scalability focus, such that businesses and organisations can continue, scale-up or replicate interventions beyond the life of the project. Below is tentatively proposed as an action plan for the project to take forward. This should be reviewed and updated regularly when new market information or analysis becomes available in light of changing sector dynamics.

The intervention strategy looks at three specific channels to leverage the ongoing and recently completed major upgrades to processing capacity in the Southwest and Eastern regions in a way that can create more and better jobs and enhance dairy exports. Here, the project will work in three main streams, which are broadly set out below and detailed on an individual intervention basis in subsections thereafter. It should be noted that these are initial ideas which require further exploration and development during implementation. The project will also conduct more in-depth analysis on the inclusion of women producers, collectors and processors, the specific barriers they face, and identify opportunities to improve their participation and economic empowerment.

- **Build-up farm level productivity.** As processors add considerable capacity, they will need to source more production. This can be done in three principal ways: i) improving productivity through the uptake of animal feed, better animal health and better breeds; ii) pulling more milk from the informal market to the formal

market; and/or iii) enhancing production through growing herd sizes or bringing new farmers into production. Here, the project will principally work on the productivity angle, and will hope to pull in more dairy farmers to more formal milk production through Intervention Area 2. Efforts in this stream will principally target increasing incomes for dairy farmers and reducing greenhouse gas emission intensity.

- ▶ **Enhance MCC handling, cooling capacity and outreach.** The MSA uncovered two key elements i) MCCs have insufficient cooling capacity relative to the current and future processing capacity in the Southwest and Northeast and Eastern regions; and ii) most losses take place at the MCCs. The work here intends to address these two key issues as well as utilise MCCs to bring in more informal producers to the formal market, particularly in the low season. These efforts should increase incomes for farmers (albeit to a lesser extent than stream 1) and strengthen processor ability to access milk, hire waged workers (including youth and women) and increase exports.
- ▶ **Strengthen the regulatory and trade promotion functions.** With the DDA being subsumed into MAAIF, the sector oversight, regulation and enforcement are in a process of transformation. While this is already underway, it would be worthwhile to support the government to maximise its sector regulation and enforcement relative to its resource allocation in a way that can support the sector to grow, create more value addition opportunities and diversify product exports and destination markets. Overall, this could help support quality and efficiency in the sector, which in turn could “pull” for more farmers into formal milk production, increase their incomes and strengthen the likelihood that SMEs can enter the export market.

Intervention Area 1: Build-up farm level productivity

- ▶ **Improve the adoption of preventative animal health services**

Animal disease, tick-borne illnesses in particular, were reported as the principal challenge to farm level productivity. In this area, the project should take a long-term approach, and work in the regulatory space to enable a more proactive approach to addressing tick-borne illnesses (vaccines) rather than a reactive one (treatments). As a first step to working with the government, the project can quantify the cost of tick-borne illness to the dairy sector on both mortality and productivity. While stakeholders indicated this to be a problem, few had data to support what the total losses meant for the sector. Once this data is available, the project can work with NARO to accelerate the regulatory approval of the vaccine and once approved, the project can use the research to help the government invest appropriately into getting it to market and targeting areas where it could have high impact on the sector.

As a second pillar, the project can work to limit the entry and sale of counterfeits, which undermine the trust and uptake of animal health products. To do this, the project can support the MAAIF to develop regulation and enforcement measures to apply the broad Anti-Counterfeit Goods Bill to the dairy sector. This bill, which has considerably higher punitive measures for counterfeits, can be passed by parliament in Q2/Q3 of 2025.

- ▶ **Address key animal breeding bottlenecks**

Considerable productivity gains can be made through the adoption of exotic breeds, which can be accelerated through strengthening the provision of private AI services. In this area, the project can work with animal genetics companies, who are working to get a foothold in the market, to further build awareness and test and trial new outreach models particularly in the Southwest region. To support this, the project can conduct market research to indicate where market uptake potential could be highest such that genetics companies could better target marketing and awareness activities. The project can also develop alternative payment structures that would allow farmers to pay for AI services over time such that the initial cost barrier is reduced. If a model is successful, the project can work to roll it out with other genetics companies.

- ▶ **Strengthen access to feed**

Better access to feed and nutrition can enhance overall productivity, particularly in the dry season when production dips and prices rise. Development of the feed market may also engage women and youth more directly. The approach here can be multi-pronged. The first prong would be to strengthen the fodder seed distribution market by working with existing seed distributors to revise marketing strategies to encourage the fodder production uptake on large landholdings which could be cut and sold for commercial sale or cut and stored for on-site feed. A second angle would target fodder harvest and processing, working through businesses or potentially MCC cooperatives to acquire basic machinery to either rent out or deliver a comprehensive service to farmers growing fodder. The farmer could store and use that fodder for themselves and/or sell it. The last area would be to strengthen the market outreach of existing companies that sell fodder.

► **Improve smallholder access to finance**

Simple infrastructure upgrades, such as investing in water channelling and pumping infrastructure and milking structures, can have benefits to farm level productivity and worker safety. However, investments of these sizes have few financing options, and it is unclear which investments have the best return on investment. The project could work through the financial viability of several smallholder farm upgrade options and work with formal financial service providers to test which ideas could be credit ready. The project could then use a credit guarantee scheme to test these options, perhaps drawing on the Sida-funded social finance programme.

Intervention Area 2: Enhance MCC handling, cooling capacity and outreach

► **Enhance MCC utilisation and enhance storage capacity**

As processing capacity grows in both the Southwest and Eastern regions, milk collection capacity needs to be enhanced to ensure that it does not become a bottleneck. Additionally, milk is lost at MCCs, particularly during peak production season, given that MCC storage is at capacity and excess milk cannot be cooled. As a first step toward addressing these issues, the project could map out MCCs, particularly in the Southwest, to identify both their seasonal utilisation and supplier base. Using this mapping, the project can identify underutilised MCCs that serve a solid farmer catchment and then to try help them better outreach to new farmers and connect to buyers (this links to the intervention on supporting MCC cooperatives in the Eastern and Northeast regions below). To support MCCs at capacity, the project can work with financial service providers to develop and test credit options into scaling infrastructure, perhaps through credit guarantees. The project can collaborate with cooperative unions as an entry point to cooperative MCCs to help them become credit ready. As they grow, the MCCs will be able to create jobs, including for women and youth.

► **Strengthen MCC support services**

Specialised services to train MCC staff on quality testing or provide maintenance and repair services are not readily available. On the former, quality testing is a key frontline area for differentiating quality, which can bring higher prices and limit contaminated milk from entering cooling tanks. Most MCCs in the Southwest region have testing equipment, which is highly reliant on trained staff. However, when these staff leave, the MCCs are left with no residual testing capacity. As these staff have been trained by development programmes or government, there is no “on-call” function to train MCC staff in testing quality. On the latter, the Southwest region does not have any service technicians to support when machinery breaks down, increasing time, costs and spoilage if machinery breaks down. Given the relative thickness of MCCs in the southwest, the project could work to set-up a quality testing training and/or repair service for MCCs either as an independent company of technicians/consultant service providers or through processors which have an incentive to ensure quality at MCCs. Both new services will create jobs for women and youth.

► **Upscale quality payment systems across processors**

Price differentiation based on milk quality can serve as a “pull” for farmers to produce better quality milk. However, MCCs typically do not pay a premium price which limits farmer incentive to produce better milk. At

least one large-scale processor has rolled out a quality payment system, proving that such a system is possible and working. Here, the project could assess how this quality-based system works, determine why quality-link payments have not been adopted further and work to roll-out such a scheme with across other processors.

► **Support MCC cooperatives in the Eastern and Northeast regions**

Recently established MCC cooperatives in the Eastern and Northeast regions are running far below capacity. This leaves the regions ill-equipped to feed into the large-scale Mbale processor, once it comes online in the coming years. Here, the project can work to support these cooperatives to better understand why outreach has been limited to date, and work to address issues which limit recruitment. This may serve as a pull for existing informal milk producers to enter the formal market.

Intervention Area 3: Strengthen regulatory and export promotion functions

► **Strengthen private sector coordination**

One avenue to support more effective regulation is to ensure that the private sector views are considered in the development process. Here, the project will first look to understand more about why business membership organizations (BMOs) have not been effective in the past, both in talking to the development organisations that previously sponsored coordination efforts and by bringing together stakeholders from across the value chain to discuss and determine what might be useful for them as a collective. Based on this and lessons learnt to develop effective BMOs in MSD projects⁵¹, the project will work with stakeholders to develop a roadmap to identify future goals, objectives, membership benefits and resourcing such that the sector can have an effective coordination mechanism that sustains beyond the life of the project.

Additionally, through this mechanism, the project can later explore the potential to build a culture of self-regulation, perhaps looking at how processors can influence other actors to comply with guidelines, standards and codes of practice for the benefit of the organisation. Here, the project can work with UNBS who may be willing to subsidise a BMO to enforce regulations on behalf of the government, a process that has already been actioned in the grains sector. Beyond strengthening the compliance to dairy standards, self-regulation can create membership value for BMO members, enhancing BMO membership and strengthening overall coordination.

► **Accelerate the development of sector regulations**

There is a need to quickly operationalise the DDA Industry (Amendment) Act 2024, the Animal Diseases Act, the Veterinary Practitioners Act 2024 and the Anti-Counterfeit Bill (once enacted). The project will hold discussions with MAAIF and the private sector to prioritise the regulations that can have the most meaningful impact on the sector. While this could likely mean first getting a functional version of the DDA running in MAAIF before addressing any of the other issues, there is need to action the other acts as well. For each Act that needs support to bring into regulation, the project can convene MAAIF and industry stakeholders to support the drafting of regulations, their uptake and eventual operationalisation and enforcement. Part of this process can involve taking a hard assessment of enforcement and looking at what are the most effective ways to enforce these regulations given available resourcing.

► **Support more effective communication of standards**

Understanding of standards and regulations is key to adopting and conforming to them. As several sector standards and regulations are too technical to be well understood and applied by the market actors, the project will work with regulatory agencies like UNBS and MAAIF to simplify, illustrate, translate and disseminate

⁵¹ Cowan Gore, Isaac. *Market systems and Business Membership Organisations: Who should we work with and how can we get to scale?*. Beam Exchange. 2020.

standards and regulations amongst industry players. More simplistic communication around standards could also help support self-regulation within the industry (connected to the intervention on strengthening private sector coordination). The project can then work through UNBS and MAIF to support dissemination to processors, MCCs and farmers via a range of means such as WhatsApp message groups, SMS and training videos.

► **Support more effective trade promotion**

While this project may not be able to disentangle overlaps within various export promotion agencies as they serve a broader export function beyond the dairy sector, it could work to ensure that export promotion efforts are better targeted for the dairy sector. To do this, the project, alongside the Uganda Freezones and Export Promotion Authority (UFZEPA), can conduct market demand research on higher value-added products. This can determine which value-added products have potential and to which markets, and can also look at potential production costs and revenues. The project and UFZEPA can then present the research through the sector coordination body and/or work with SME processors to help them determine which products might be practical to produce to such markets. The project and UFZEPA can work on export readiness assessments to identify which firms most fit for export and work with them to mark out a road map to move into those markets.

5. Conclusion

The project has a considerable opportunity to develop Uganda's dairy sector in a way that generates both exports and more and better jobs for youth, women and the poor. The analysis in this study provides the project with a starting point to engage with and drive change in the sector through three potential intervention avenues. These interventions aim at enhancing dairy producers and processors to access higher-value international markets, which can improve livelihoods for farmers and create growth opportunities for small and medium processing businesses.

To meet increasing processing capacity, the project will focus its first work area on improving farmer productivity through better feed, animal health, and breeding practices and increasing investments into key farm level infrastructure upgrades. The primary aim of these initiatives is to increase dairy farmers' incomes.

The project's second intervention area will focus on addressing insufficient cooling capacity and reduce losses at MCCs, particularly in the Southwest, Northeast, and Eastern regions. Here, the project intends to strengthen MCC infrastructure investment, quality testing and farmer outreach as well as set-up quality-based payment systems. These efforts will boost farmers' earnings and also support processors by improving milk access, which can create jobs and increasing exports.

Under the third intervention area, the project will support government to enhance oversight, enforcement, and trade promotion as well strengthen the private sector's voice to influence that process. This will enhance quality and efficiency, drawing more farmers into formal production, increasing their incomes, and enabling SMEs to access export opportunities.

Finally, it should be noted that although this analysis is considered comprehensive, the project should strive to revisit, update and build upon it as it gathers more insights on the sector, its constraints and the market actors. This will help the project more aptly adapt and deliver in a rapidly changing sector.

Annex A: Research interview list

	Name of the business/organisation	Type	Location
Semi structured interviews			
1	Swedish Embassy Kampala	Embassy	Kampala
2	Large Milk processor	Processor	Kampala and Mbarara
3	Diary Development Authority (DDA)	Sector Regulator	Kampala, Mbarara and Soroti
4	Ministry of Agriculture Animal Industry and fisheries (Export/import regulators)	Export and import regulator	Kampala
5	Nshara Ranch	Government animal breeding facility	Mbarara
6	Patasente	Fintech	Mbarara
7	SNV	NGO/Development organisation	Mbarara and Kampala
8	Uganda Crane Creameries Union	Cooperative Union	Mbarara
9	Veterinary officers	Local government Extension workers	Mbarara and Mbale
10	Livestock development forum	Sector loose organisation	Mbarara
11	Heifer International	NGO	Kampala
12	Oderai Soroti Women's Dairy Cooperative	Milk cooperative	Soroti
13	Katakwi Town Council Dairy Farmers Cooperative	Milk cooperative	Katakwi
14	Dairy Farmer	Smallholder farmer	Katakwi
15	Bucitema University	Research and training institute	Arapai
16	Uganda National Bureau of Standards	Standards enforcement	Kampala, Mbale
17	DDA, UNBS Border officials	Trade regulator	Malaba
18	National Drug Authority	Regulator of veterinary medicines/drugs	Kampala
19	Uganda Export Promotion Board	Public sector-Export facilitation body	Kampala
20	Ministry of Finance Planning and Economic development	Public sector	Kampala
Unstructured interviews			
21	Private breeding company	Private sector breeding service provider	Mbarara and Kampala
22	Milk collection Centre	Private sector	Mbarara
23	SACCO	Credit and savings	Mbarara
Observation			
24	Large milk processor	Processing factory tour	Mbarara
25	Soroti milk collection centre	Milk collection centre tour	Soroti
26	Katakwi milk collection centre	Milk collection centre tour	Katakwi

Annex B: Example of regulatory involvement in hygiene and quality

The table below summarises the government ministries and agencies' core mandates and functions regarding milk handling, processing and trade/exports.

► Government regulator involvement in hygiene and quality

Agency	General mandate	Document issued	Importance of document
Dairy Development Authority	► Regulate the quality of milk (handling, logistics, processing, trade) ► Register and license milk processors, transporters, and traders ► Register and license milk processors and traders ► Control and regulate dairy and dairy-related import and export activities	Annual Registration certificates or permits to operate milk processing, trading, transportation, or cooling facility and equipment	Required for domestic operations and trade
Uganda National Bureau of standards	► Formulate or nationalise standards, certify products and processing facilities, enforce quality and safety standards of dairy products for safety	Annual Permit and Q mark or seal	Required for operation and Domestic and export trade
Ministry of Agriculture Animal Industry and Fisheries	► Inspection and certification of premises and processes ► Inspection and certification of consignments ► Issuance of veterinary health permits	Inspection report per consignment of lot Veterinary health permit (valid for 2 months)	Required for International Trade
Ministry of Local Government Inspectors	► Inspection of premises, processes and personnel for fitness and safety	Public health permit for operation of premises (suitability)	Required for domestic operations

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