



-Milk Safety-

~DAIRY VALUE CHAIN~



Acronyms and Abbreviations

CIP	Cleaning In Process
DDA	Dairy Development Authority
FBI	Food-Borne Illnesses
FBO	Faith Based Organisation
FoSCU	Food Safety Coalition Uganda
HACCP	Hazard Analysis Critical Control Point
MAAIF	Ministry of Agriculture Animal Industry and Fisheries
MDAs	Ministries Departments and Agencies
MoFPED	Ministry of Finance Planning and Economic Development
MoH	Ministry of Health
MT	Metric Tonnes
MTIC	Ministry of Trade Information and Cooperatives
NDA	National Drug Authority
NDP	National Development Plan
UBOS	Uganda Bureau of Statistics
UHT	Ultra-High Temperature
UNBS	Uganda National Bureau of Standards
USD	United States Dollar



Dairy farming is one of the agricultural sub-sectors prioritized by the Government of Uganda, under its third National Development Plan (NDP III) 2020/21-2024/25, due to its potential to drive the industrialization agenda. Uganda's domestic milk production increased from 2.08 billion litres in to 3.2 billion litres between 2015 and 2021 (Dairy Development Authority, 2022). The Ministry of Agriculture Animal Industry and Fisheries (MAAIF) estimated increase in export revenue from dairy products, from USD 131.5 million to USD 205 million between 2018 and 2020, accounting for 5% of the total export revenue in the 2019/2020 fiscal year (Uganda Revenue Authority, 2021). Regulation and development of this subsector is the mandate of Dairy Development Authority (DDA), a statutory body under MAAIF, established under the Dairy Industry Act, 1998. Among others, DDA is charged with developing and enforcing the adherence to dairy quality standards, through inspection (of dairy handling sites, import and export shipments, equipment used by milk transporters) and milk testing.

The dairy sub-sector benefits more than 2.5 million farming households, through; nutrition, employment, and income generation among others, significantly contributing to reduction of the country's food insecurity and poverty burden (Wangalwa et al., 2016). With a fast-growing population, especially in urban areas, there is increased demand for dairy products such as fresh milk, cream, ghee, flavoured milk, long life/UHT milk, yoghurt, and butter. However, in their quest to keep up with consumption demand, unsafe practices such as milk adulteration and use of counterfeit veterinary drugs (Mbeiza, 2021) have been reported among different livestock value chain actors, thus jeopardizing the health of the final consumer (Sugino et al., 2023). Such practices thrive on inadequacy of the country's food control systems, enforcement of regulatory framework, and limited capacity of actors among others. These gaps hinder trade relations with trading partners hence economic losses, contribute to a growing burden of food-borne illnesses {such as brucellosis, anthrax, helicobacteriosis}and the associated cost burden.

Synthesizing of existing information on food safety gaps in the dairy value chain is crucial to inform efforts such as technical and infrastructure capacity building, awareness creation, policy, legislation, and compliance, from state and non-state actors to ensure production of better quality dairy products that are safe, meet standards, and competitive and in the international export market (Komugisha, 2023). It is against this background that Food Safety Coalition Uganda (FoSCU) undertook a review of relevant literature, with the objectives to:

- i. Assess the process and actors in Uganda's supply chain for milk and milk products.
- ii. Understand the most common food safety hazards in Uganda's dairy value chain.
- iii. Ascertain and synthesise common unsafe practices by dairy value chain actors in Uganda

What did FoSCU do?

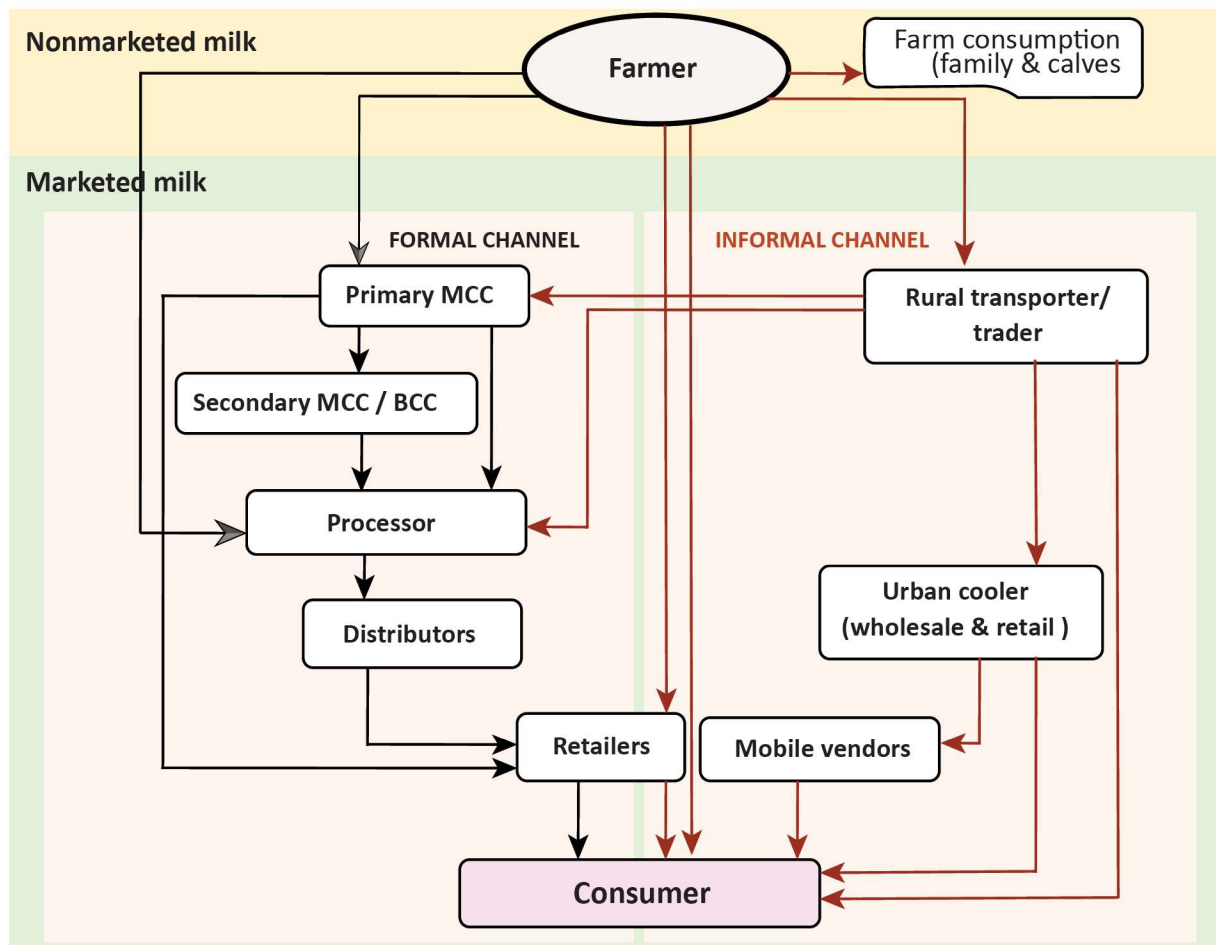
We conducted a desk review of literature relevant to the context of milk production and distribution in Uganda. The used document review guide included but not limited to:

- Scientific research papers
- Review articles
- Local newspaper articles
- Expert opinions
- Research reports
- Intervention reports
- Professional blogs
- Policies (including Strategies and Plans)
- Legislation

What did FoSCU find?

→ The process and actors





From our literature review, we generally learned that Uganda's dairy value chain comprises of two main distribution channels of dairy products- formal and informal, with each stage of either channel involving different actors (Ariong and Campenhout, 2023), as shown in the figure below.



Source: DDA (as cited by Ariong and Campenhout, 2023)

→ Unsafe practices and associated hazards

Some of the most common unsafe practices that we identified in our reviewed literature are summarized in the table below, alongside the hazard category they are associated with.

Hazard type	Contributing Factors/Unsafe Practices
<p>Chemical</p> <p>High residues of vet drugs, acaricides, preservatives and other chemicals in milk and other dairy products</p>	<ul style="list-style-type: none"> • Non-adherence to recommended acaricide, antibiotics, and other vet drugs' dosage and withdrawal periods due to farmers' self-prescription and self-treatment of animals. • Use and easy access over the counter of banned veterinary drugs and antibiotics by farmers. • Accidental use of fraudulent preservatives. • Deliberate milk adulteration with chemicals to prolong its shelf-life. • Use wrong detergents used to wash the milk holding cans 
<p>Biological</p> <p>Pathogenic viruses, parasites, bacteria, and fungi in milk and other dairy products</p>	<ul style="list-style-type: none"> • Poor on-farm hygiene practices such as udder and handwashing, and equipment cleaning, resulting in microbial contamination of fresh milk. • Cultural practice of consuming raw or half cooked milk. • Use of inappropriate means and facilities of transporting milk, without cold chain system, resulting in microbial contamination hence milk spoilage. • Inadequate animal disease prevention and control at farm level resulting in microbial pathogens in the milk. • Adulteration of milk with non-portable dirty water by mobile milk distributors, including poor unhygienic serving containers. • Feeding dairy cattle on contaminated pastureland, forages, and commercial feeds. • Poor hygiene and sanitation at milk distribution outlets and processing facilities. • Unreliable and costly utility services such as electricity, hampering the effective use of cold-storage facilities at milk distribution outlets.   
<p>Physical</p> <p>Foreign material e.g. stone/wood/hair pieces, dust in milk and other dairy products</p>	<ul style="list-style-type: none"> • Unkempt milkmen and physically contaminated milking shades and containers • Physical dirt from used to adulterate milk by mobile milk distributors. • Selling milk from non-gazetted open spaces such as dusty environments along roadsides • Transporting inadequately covered milk along dusty marram roads from the local milk collection points.

What does FOSCU recommend?

1. Strengthening the national food control system by fast-tracking the establishment of the Food and Agriculture Authority to spearhead food safety regulation in the country.
2. Improving food safety coordination by establishing a food control management that is based on evidence and a risk analysis framework to facilitate continuous planning, monitoring, and communication, in an integrated way, of policy and regulatory decisions and actions to ensure safety of milk in the country.
3. Undertaking timely reviews of the dairy sector's policy framework to ensure that it is responsive to the current local and international dairy environment.
4. Delegating the inspection mandate to local governments to ensure regular and timely compliance monitoring among grassroots dairy production and distribution facilities.
5. Increasing public financing to strengthen the enforcement function of existing MDAs like MAAIF, UNBS, NDA, DDA, and MoH. For instance, this could be through skilling and retooling existing inspectors as well as recruiting, training, and deploying new competent personnel.
6. Allocating financial resources to strengthen the country's laboratory infrastructural capacity to conduct microbial quality tests for dairy and dairy products.
7. Strengthening the institutional and human resource capacity of the food and agriculture authority to spearhead coordination of key food safety functions such as inspection, certification, animal monitoring and surveillance as well as traceability systems and infrastructure.
8. Dedicating efforts towards establishment of public-private partnerships as a vehicle to:
 - a. harmonized behavior change campaigns and information dissemination to value chain actors on regulatory and non-regulatory measures for improving safety and quality of dairy products
 - b. subsidized access to infrastructure such milk cooling facilities, milk tankers with Cleaning In Process (CIP) system
 - c. effective implementation of Hazard Analysis Critical Control point (HACCP)
 - d. coordinated and adequate waste or effluent management
 - e. timely, regular, and effective health clearance inspections by authorities and standards bodies.
9. Fast-tracking the enactment of the Consumer Protection Bill to facilitate harmonized setting of quality, safety, and reliability of goods, including dairy products, remedies of non-compliance and prohibition of unfair trade practices.
10. Strengthening the capacity (human resource, infrastructure) of relevant research institutions to facilitate regular and timely generation of data on food safety in the dairy value chain to guide policy decisions and build investment cases for food safety in the subsector.
11. Strengthening veterinary and extension service provision in the major milk production areas.

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For more information, watch these videos:

1. Food safety in dairy value chain: <https://youtu.be/ckqag-Bd1Yo>
2. Food safety hazards and tips: <https://youtu.be/SXZvO4zAi7g>



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