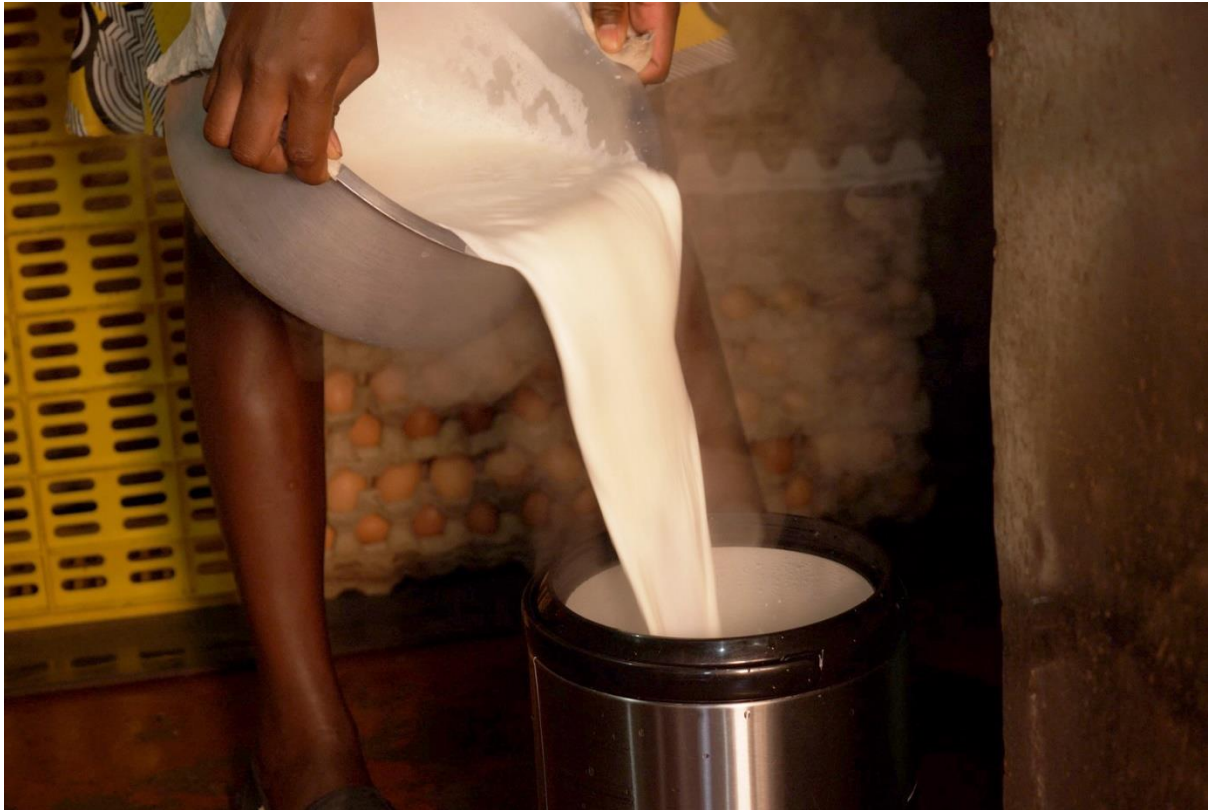


Stirring up the informal dairy sector in Kenya: solutions that change, sustain and scale



MoreMilk end-of-project workshop report

23 June 2023



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Compiled by Tezira Lore

Cover photo: Pouring boiled milk in Waithaka, Nairobi, Kenya (ILRI/Shadrack Isingoma)
<https://www.flickr.com/photos/ilri/49943914993/>

Contents

Abbreviations and acronyms.....	iii
Acknowledgements.....	iv
Introduction.....	1
Workshop proceedings.....	2
Introductions and welcome remarks.....	2
Menti question #1.....	4
Scene-setting panel discussion: The informal sector – a blessing in disguise?.....	4
Menti question #2.....	6
Introduction to the MoreMilk project.....	6
Session 1: Solutions that change.....	8
Session 2: Solutions that sustain.....	13
Session 3: Solutions that scale.....	15
Panel discussion: Future directions for the informal dairy sector.....	15
Closing remarks.....	17
Annex 1: List of participants.....	18
Annex 2: Workshop agenda.....	19
Annex 3: Quotes from the trained vendors.....	20
Annex 4: Selected peer-reviewed articles from the project.....	22

Abbreviations and acronyms

GDP	gross domestic product
IFPRI	International Food Policy Research Institute
IIED	International Institute for Environment and Development
ILRI	International Livestock Research Institute
KDB	Kenya Dairy Board
KDTA	Kenya Dairy Traders' Association
LMICs	low- and middle-income countries
RCT	randomised control trial
SEEMS-Nutrition	Strengthening Economic Evaluation for Multisectoral Strategies for Nutrition

Acknowledgements

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Introduction

The goal of the *MoreMilk: Making the most of milk* project was to generate research evidence on how informal milk markets can be leveraged to improve nutrition and health, especially in peri-urban settings. The overall objective of the project was to improve child health and nutrition outcomes through milk consumption.

The project was led by the International Livestock Research Institute (ILRI) and implemented in collaboration with Emory University, the International Food Policy Research Institute (IFPRI) and the International Institute for Environment and Development (IIED). Other key institutional partners in the implementation of the project were the Kenya Dairy Board (KDB) and the County Governments of Nairobi and Uasin Gishu.

Initially designed to be implemented from 2016 to 2021, the project was given a no-cost extension to 2022 on account of disruption of field research activities during the COVID-19 pandemic.

The project evaluated the potential of milk markets and dairy development interventions to contribute to health and nutrition outcomes by:

- assessing how markets and policies influence the quantity and safety of milk consumed in Nairobi, Kenya and Dar es Salaam, Tanzania;
- assessing the health and nutrition benefits of a successfully piloted informal dairy sector intervention (a trader training, certification and marketing scheme), through a randomised control trial in Eldoret, Kenya;
- assessing the potential reach of the dairy trader training and certification intervention, as well as bridges and barriers to scale and sustainability through surveys in India, Kenya and Tanzania; and
- assessing the drivers of milk consumption in dairy farming households in rural Kenya and Tanzania and developing a social behaviour change communication strategy for milk consumption.

The project integrated a gender lens across these components, with a focus on understanding the ways in which women's empowerment can be leveraged to enhance milk quality and household nutrition.

To mark the official close of the project, ILRI organised an end-of-project workshop on Friday 23 June 2023 at the Golden Tulip Hotel, Westlands, Nairobi. The workshop brought together 52 participants to reflect on the project's research findings and brainstorm ways to sustainably transform the informal dairy sector in Kenya. The list of participants is shown in Annex 1 of this report. The workshop took place through a series of presentations, facilitated panel discussions and question-and-answer sessions. The workshop agenda is shown in Annex 2 of this report.

Workshop proceedings

Introductions and welcome remarks

Silvia Alonso, senior scientist at ILRI and MoreMilk principal investigator

Silvia Alonso began by welcoming the participants and stated that the main objectives of the workshop were to share the key findings of the MoreMilk project and brainstorm on how to transform the informal dairy sector. She then invited other welcome remarks by representatives from ILRI, KDB and the Bill & Melinda Gates Foundation.

Iain Wright, Deputy Director General, Research and Development – Integrated Sciences, ILRI (via video recording)

Iain Wright gave a brief overview of ILRI's research agenda, which includes testing of interventions. One such research project is MoreMilk, whose focus is on securing the health and wealth of Kenyans by strengthening informal markets where most people buy their food. He noted that the dairy sector contributes significantly to Kenya's gross domestic product (GDP) and to food and nutrition security. Thus, there is a need for more efficient storage and distribution of milk to reduce waste. Kenya's urban transformation and growing demand for milk is an opportunity to support dairy development. This will involve designing innovative strategies to transform the informal sector, capacity building and providing incentives. He acknowledged the MoreMilk project as an example of how capacity building, incentives and an enabling environment can transform informal markets. He concluded by reiterating ILRI's commitment to contributing resources and research expertise, and acknowledged the contributions of partners, collaborators and stakeholders, in particular, the KDB.

Isabelle Baltenweck, Program Leader, Policies, Institutions and Livelihoods, ILRI

Isabelle Baltenweck said that brainstorming on how to transform the informal dairy sector would be the most important part of the discussions, noting that the sector's transformation will benefit both dairy producers and consumers and improved milk quality will benefit all stakeholders. She also mentioned the need to examine the research evidence to understand what it means and draw on solutions that work at scale.

Delia Grace, Professor of Food Safety Systems, Natural Resources Institute, University of Greenwich and Joint-appointed Scientist, ILRI (via video recording)

As the initial principal investigator and project launcher, Delia Grace began by reflecting on the long journey that the project went through from the development of the proposal in 2016 to having to relocate the randomised control trial (RCT) from Nairobi to Eldoret due to the COVID-19 pandemic. The project started under ILRI's Food Safety and Zoonoses program and represents the most complex testing of the training and certification framework developed by the earlier Smallholder Dairy Project. MoreMilk uses the 'three-legged stool' approach, which states that food safety in informal markets in low- and middle-income countries (LMICs) can only be improved if three conditions are in place: training and technology for value chain actors, an enabling environment, and motivation for behaviour change through incentives or nudges. In addition to the MoreMilk project, ILRI has other food safety projects in Burkina Faso, Cambodia, Ethiopia, India, Nigeria and Vietnam. She concluded by reiterating that the three-legged stool approach can help to improve food safety in informal markets in LMICs in a sustainable and scalable manner.

Margaret Kibogy, Managing Director, Kenya Dairy Board

Margaret Kibogy began by stating that the mandate of KDB is to regulate the dairy industry in Kenya, and ensuring the safety and quality of milk is a key aspect of this mandate. She expressed her gratitude to ILRI for supporting KDB's mandate through research and dissemination of findings and lessons learned, noting that KDB has worked with ILRI for many years to support sustainable development. She then expounded on the socio-economic importance of the dairy industry in Kenya as a contributor towards income, employment, social enterprise and food and nutrition security. The dairy sector is, however, beset by a number of production constraints such as climate change, animal diseases and competition for arable land. There is therefore a need for sustainability and reliable markets. She noted that there is a high demand for milk and milk products, and that the country's dairy sector encompasses both formal and informal production and sale. There are a number of challenges in the informal sector, thus capacity building is needed to ensure compliance with laws that govern the quality and safety of milk and dairy products.

She said that the informal dairy sector has an important role in socio-economic transformation and that the Bottom-up Economic Transformation Agenda of the Government of Kenya provides opportunities for primary producers to benefit from increased milk production. She mentioned that the Sessional Paper No. 5 of 2013 provides for training, market linkages and certification and that the Dairy Regulations of 2021 provide for certification of actors in the informal sector. Primary producers can sell raw milk to neighbours or supply their milk to pasteurisation plants; there are 15 such plants around the country with a processing capacity of 150,000 litres per day.

She acknowledged the contribution of various partners such as ILRI, SITE Enterprise Promotion, the Kenya Dairy Traders' Association and the State Department of Livestock, noting that several successful ILRI projects, such as MoreMilk, have informed policy. She noted that leveraging informal markets to improve quality and nutrition remains a key area of focus and that informal dairy traders have a responsibility to comply with food safety and quality regulations. She concluded by congratulating the team on the successful completion of the project and said she looked forward to the deliberations and dissemination of the findings, noting that "there is no action without research and no research without action."

Shelly Sundberg, Senior Program Officer, Bill & Melinda Gates Foundation

Shelly Sundberg began by observing that current food systems are not delivering nutritious foods and noted that dairy is an important source of nutrients especially for children and vulnerable groups. Thus, there is a need to increase consumption of safe, nutritious diets and improve food safety in informal markets. By addressing food loss and increasing food security, health outcomes can be bolstered. She said that the MoreMilk proposal was accepted in 2016 because at the time, there was a lack of evidence on feasible and sustainable market-level interventions to improve consumption of milk and dairy products. She mentioned that she had an opportunity to observe one of the training sessions, visited the dairy shops and saw the process evaluation. She therefore looked forward to discussing the results and how they can inform the safety and affordability of milk and milk products in Kenya.

and 15,000 members. There is a high preference for milk sold by the informal sector and part of the appeal for this milk comes from the convenience to consumers because the informal traders can access remote areas (by motorcycle or donkey) to buy milk from the producers and deliver it to road junctions or the consumer's doorstep in less than two hours after milking.

- **Charles Kibue:** As a public health regulator, he said that his main mandate is to ensure the safety of milk sold to consumers, especially in the informal settlements. To this end, the county carries out regular sampling and testing of milk. However, he acknowledged the challenge posed by some unscrupulous traders. He noted that milk dispensers are now widespread within the county and are a source of employment for many people.

Moderator: If you had one wish to change or improve the dairy sector in Kenya, what would it be?

- **Charles Kibue:** Regulation at the community level.
- **Kituto Kitele:** All milk in the country achieves compliance with quality and safety requirements. When this is done, everything else will fall in place: markets, competitiveness, consumer interests will be served, growth of the industry, improved quality and diversification of products.
- **Samuel Chiira:** Improve the quality and safety of milk; value addition; increased revenue of farmers and traders.

Responses from the audience to the same question

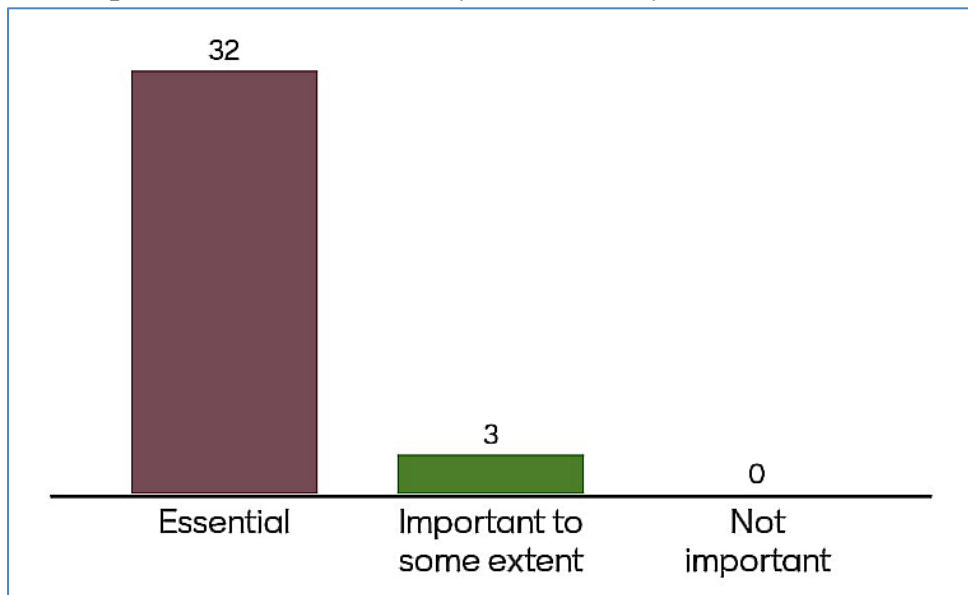
- Step up surveillance of key hazards in milk
- Farmers get the best price; no powder milk imports; enough animal feed
- Minimise pre- and post-harvest milk losses
- Farmers are paid based on the quality of milk produced
- Transform the informal dairy sector to formal
- KDB should be friendly with milk vendors so that they do not hide milk and contaminate it; they will end up selling more milk and it will be affordable.

Closing statements

- **Kituto Kitele:** There is a new set of dairy regulations in place from 2021 with measures to help farmers. We need to transform the informal sector, not get rid of it. KDB is working closely with informal traders and has various levels of permits for milk bars, dairies etc. Enforcement is expensive; dialogue and engagement are more effective and will achieve a win-win for everyone.
- **Charles Kibue:** Health is devolved to the 17 sub-counties in Nairobi County. The county government is committed to engagement and promotion of business. However, there is room for improvement by the county council ('kanjo') inspectors.
- **Samuel Chiira:** KDTA is working well with KDB, but not so well with the kanjo inspectors. However, there is commitment to improve the relationship. New dairy traders are well equipped with knowledge on safe milk handling so there is need for collaboration; they should not have to hide from the kanjo inspectors.

Menti question #2

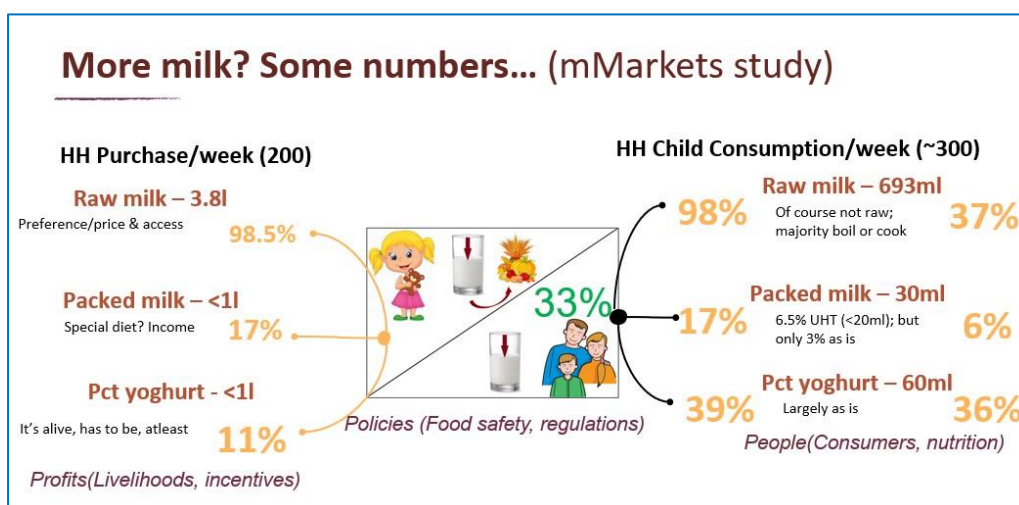
How important is the informal dairy sector in Kenya?



Introduction to the MoreMilk project

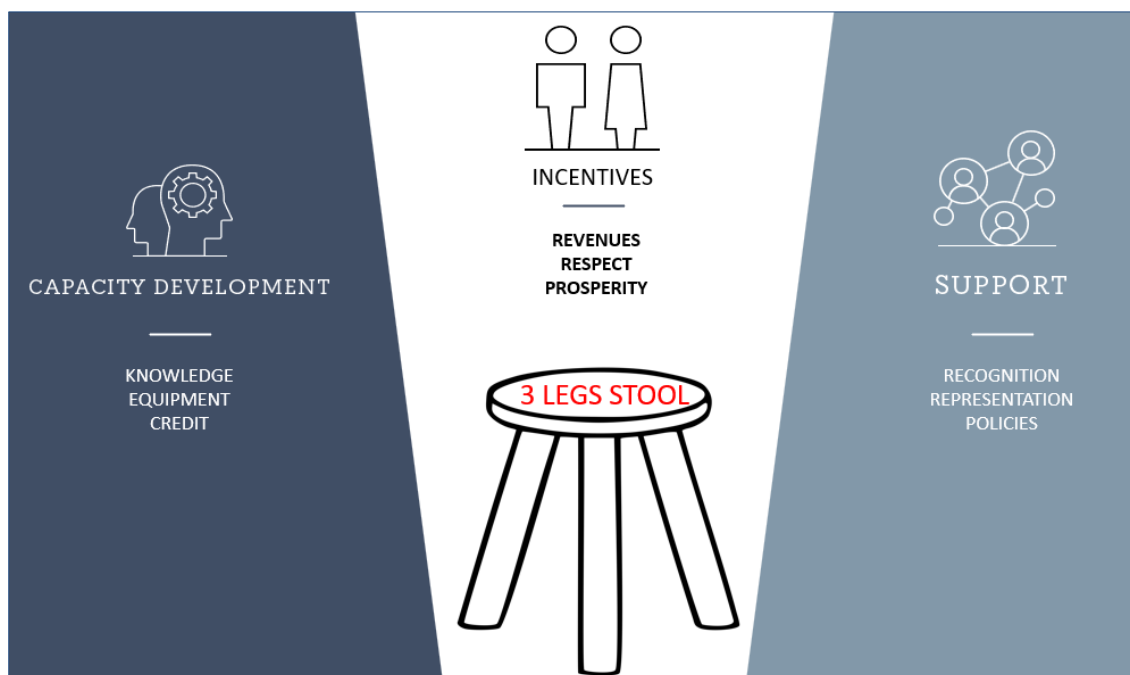
Informal markets and nutrition: Emmanuel Muunda, Research Associate, ILRI

Milk is important for the growth and cognitive ability of children. The dairy value chain includes both formal and informal sectors, with the informal sector playing a pivotal role in meeting the nutritional needs of low-income households. Weaned children are given milk to drink, but is it enough as per the recommended amounts? To answer this question, the mMarkets study assessed household milk purchase and consumption per week. Price of milk and household income were key determinants of household demand for milk and the quantity of milk that was available for children to drink. The recommended amount is at least two cups of milk per day, but the study found that the actual consumption was less than one cup per day. Thus, recommendations need to be alive to the realities of household demands.



Informal markets and food safety – three pillars of food safety improvement: Silvia Alonso, ILRI

In a 2015 report, the World Health Organization estimated that the health and economic burden of foodborne disease is of the same magnitude as HIV/AIDS, tuberculosis and malaria, with the largest burden in Africa and Asia. Public health concerns are similar in the formal and informal sectors, but the focus of the MoreMilk project was on the informal sector. The African Union has developed a Food Safety Strategy for Africa to provide a harmonised framework to implement activities that mitigate various food safety threats. The implementation plan is being developed. The strategy identifies the need for context-specific interventions; the MoreMilk project is one of these. Three key elements are needed to effectively transform the informal dairy sector and improve food safety: training and simple technology to build capacity of value chain actors, incentives to motivate behaviour change, and an enabling environment with supportive authorities. We call this the ‘three-legged stool’ approach.



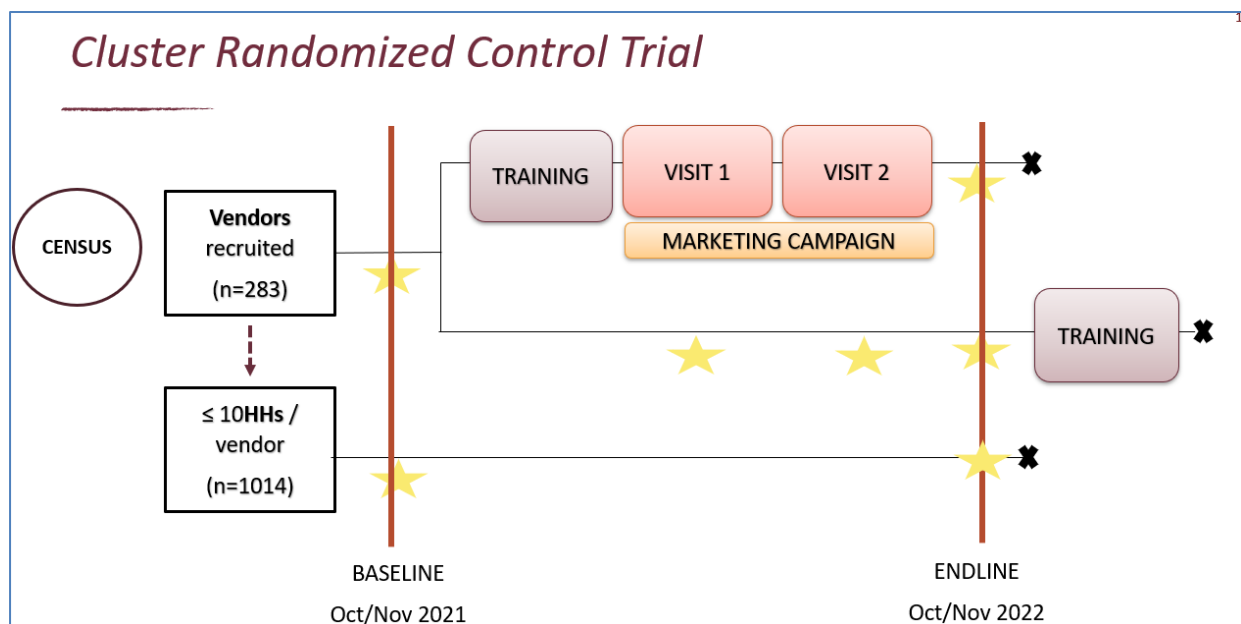
Video: The MoreMilk project in two minutes

MoreMilk project: Safer milk, better business https://youtu.be/ERjNhXFXZ_4

Session 1: Solutions that change

The MoreMilk intervention: a training, certification and marketing scheme

Silvia Alonso gave an overview of the cluster RCT which had three components: training, follow-up visits and a milk marketing campaign. The RCT was initially designed to be carried out in Nairobi but ended up being moved to Eldoret due to movement restrictions during the COVID-19 pandemic. Two hundred and eighty-three vendors were recruited for the baseline as well as up to 10 households that bought milk from them. They were then split into two double-blind groups (control and intervention). Training was carried out at baseline (October–November 2021) and endline (October–November 2022). After the training, there were two follow-up visits and a milk marketing campaign. At the end of the survey, training was offered to the control group as well.



Training

Samuel Muiruri, a dairy consultant and MoreMilk trainer, gave an overview of the training component. The milk vendors' training was for a total of 15 hours and covered five topics:

1. milk hygiene during handling;
2. milk hygiene in the value chain;
3. milk hygiene and customers;
4. business skills (record keeping); and
5. selling more milk (sales, marketing and customer care).

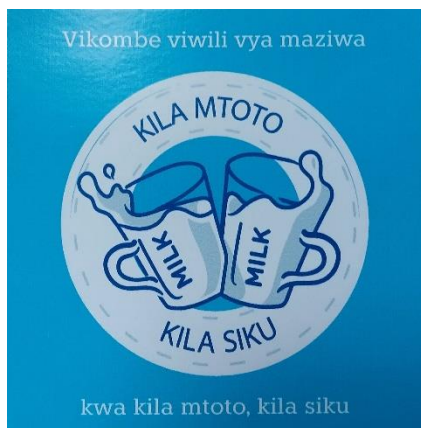
The training methods were unique and deviated from the norm. The training used smaller groups of vendors and each topic was covered on each day to minimise learner fatigue. Through hands-on sessions, the vendors were able to carry out the milk quality tests themselves. The vendors also learned from one another through case studies and from professional trainers through open question-and-answer forums and one-on-one sessions. Recaps and debriefs at the end of the day's training sessions helped with memory retention.

Follow-up visits

Elizabeth Njoroge, a MoreMilk trainer, presented on the visits component. During the visits, there were two rounds of milk sampling for laboratory testing and reporting of the results. This allowed the vendors to identify any milk contamination in good time and take remedial action in case of high bacterial load in the milk, for example, improving on cleaning of containers or milk handling. The visits also brought transparency in the supply chain by building trust and confidence in the milk sold. Through a one-on-one personalised approach to improve quality, the vendors felt valued and this encouraged them to improve their businesses. The women vendors gained from being included in the training. Their confidence was boosted in a largely male-dominated space as they became more confident to discuss with male milk suppliers on how to handle milk hygienically thereby ensuring quality and safety to the consumer.

Milk marketing campaign

Jef Leroy, a nutritionist at IFPRI, presented on the milk marketing campaign. The approach used for the campaign was to keep the messages **simple**, **actionable** and **memorable**. A simple logo of two cups of milk was designed with the message: ‘Two cups of milk for every child, every day’ (in Kiswahili: ‘*Vikombe viwili vya maziwa kwa kila mtoto, kila siku*’) It is important to note that this nutrition message was **not** aimed at children under six months of age because they are meant to be exclusively breastfeeding.



The messages were communicated on branded posters, stickers and calendars. The vendors were the main change agents and were equipped with branded caps and white coats. The nutrition and safety message targeted at consumers was ‘Cook it, cool it, cover it’ (in Kiswahili: ‘*Chemsha, poesha, funikia*’).

The images of children were aspirational, depicting what parents desire for their children: to grow and become healthy, smart and strong. Vendors also gave checklist cards to the customers so that they could ‘put their milk vendors to the test’ and observe if the vendors were complying with the proper milk handling practices. This informal contract between the vendor and the customer helped to build trust and enabled a consumer-oriented approach towards improving milk quality.



NJIA BORA ZA KUHIFADHI MAZIWA YAKO NYUMBANI

1. **CHEMSHA**- Kuchemsha maziwa huyafanya kuwa salama kwa kunywa. Chemsha maziwa hadi yachemke na uyawache yachemke kwa dakika kadhaa.
2. **POESHA**-Ikiwa maziwa hayanyewi pindi yanapochemka, yapoeshe haraka iwezekanavyo. Yaweke maziwa mahali penye baridi na pasafi ndani ya nyumba, mbali na jua.
3. **FUNIKIA**-baada ya kupoesha, hifadhi maziwa yako kila wakati kwenye chombo kilichofunikwa na kifuniko, ili yasiingie viini na uchafu.





Two cups of milk for every child, every day



YOUR MILK, YOUR CHOICE;

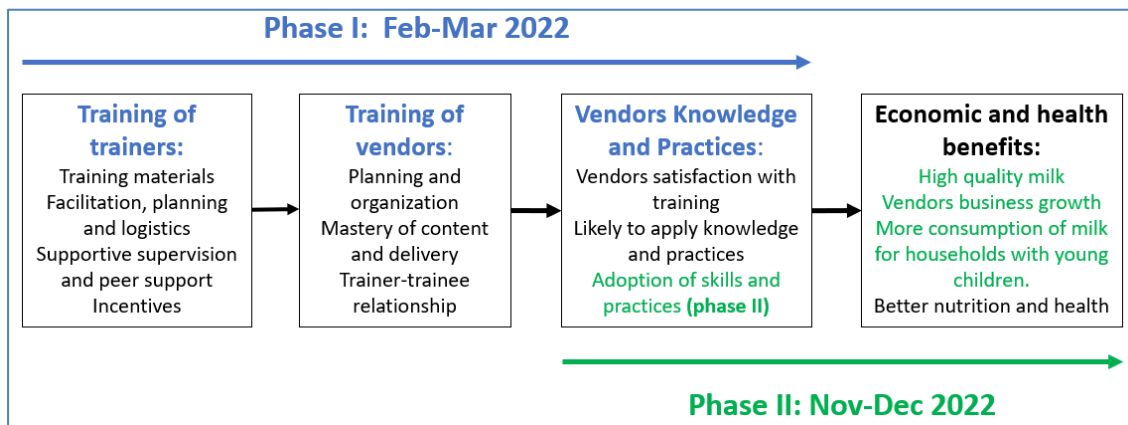
PUT YOUR MILK VENDOR TO THE TEST!

5 SIGNS OF A GOOD MILK BUSINESS

- The space and counter are clean
- The seller's hands and clothes are clean
- The milk containers are clean
- The milk is fresh, covered, and in a cool place
- The seller can answer questions on milk hygiene

Process evaluation

Emily Kilonzi, research associate at ILRI, presented on the process evaluation of the MoreMilk project, based on qualitative data collected from vendors on their experiences. The objective of the process evaluation was to assess how well the intervention was implemented. This was done in two phases. Phase 1 (February–March 2022) evaluated the training of trainers, training of vendors and vendors’ knowledge and practices. After activities through the year, the second phase (November–December 2022) evaluated adoption of skills and practices, and economic and health benefits.



The evaluation found that the vendors gained knowledge on milk handling and preservation and general milk hygiene, leading to positive changes in practice. They started testing the quality of their milk by sight-and smell tests, clot-on-boiling test and using lactometers to check for adulteration with added water. Improved communication skills were also noted, with vendors engaging with their suppliers on what they learned about hygienic milk handling and advising customers on proper handling of milk in the home and the importance of milk for children’s nutrition. The vendors also improved their business management skills, especially keeping accurate records of income, expenditure, source of milk and milk quality. Some vendors also improved their premises by painting, renovation, partitioning separate waiting areas for customers, or purchasing refrigerators for milk storage.

The positive impact of these changes on the vendors’ businesses included better quality and longer shelf-life of milk, greater customer confidence and thus increased number and loyalty of customers, increased milk sales by over 50%, low spoilage losses as all supplied milk was sold, and increased profits that enabled re-investment in the business in form of new value-added products. Households reported positive changes in the vendors, citing clean premises, dedicated waiting areas, wearing of clean white coats and general improved hygiene during milk handling and sale.

The main driver of change was the mode of training which used participatory adult learning techniques and well-prepared materials that matched the vendors’ literacy levels. There was a strong focus on hands-on practice sessions with the trainers. Follow-up visits by the trainers once every three months helped to reinforce improved practice. The barriers to change included limited financial resources to adopt improved practices like pasteurisation that require capital expenditure, limited time for training on value addition (some vendors could not attend all sessions) and external factors beyond the control of the vendors, for example, scarcity of milk in the market.

Milk safety and child nutrition impacts of the MoreMilk project

Silvia Alonso presented results from preliminary data analysis aimed at answering two questions:

1. Did we reduce bacterial load in milk?
2. Did we improve nutrition?

There was no dramatic reduction in bacterial load in raw milk between the treatment and control. It should be noted, however, that many factors affect the bacterial quality of raw milk at the various steps in the value chain. The result may need to be unpacked further to consider other possible explanations such as the effect of waning good practices with increased time after training.

On the question of improving nutrition, children in households in the treatment group recorded increased milk intake of 40–50 ml per day. Diet adequacy in calcium, vitamin D and protein did not differ between the treatment and control households, and there was no difference in the incidence of acute diarrhoea in children between treatment and control households.

Success stories from the field

Three trained vendors based in Eldoret were invited by the trainer Samuel Muiruri to comment briefly on how they benefited from the training sessions. Their remarks are summarised below. Annex 3 contains more quotes and testimonials from some of the trained vendors.

Francisca Mutai: She reported that she gained knowledge on milk hygiene and improved her engagement with customers. Her customer base increased and she was able to expand her business, leading to increased profits. With the knowledge she gained, she was also able to advise her suppliers and customers on hygienic milk handling and nutritional benefits of milk.

Daniel Kemboi: He thanked ILRI and KDB for the training opportunity which has led to increased trust from his customers arising from better milk quality. Hygiene standards improved after he switched from using plastic containers to aluminium milk cans. As a result, he recorded increased sales (almost double).

Cecilia Chepkemoi: As a result of the training, she reported that she has more confidence in dealing with milk suppliers. She now gets better quality milk from the suppliers which has reduced incidences of milk spoilage resulting in increased sales. She also learned about value addition and now also sells mala (fermented buttermilk). She is also able to explain to customers the need to observe milk withdrawal periods during deworming of dairy cows. She thanked KDB for making available the good quality milk containers (Mazzican and aluminium cans).

Session 2: Solutions that sustain

Principles for scale and sustainability: policy action

Emma Blackmore, a research associate at IIED, presented findings from a study in Kenya, Tanzania and Assam (India) that sought to understand informal milk markets. The research questions were:

- How is informal milk trade regulated?
- What are the perceptions and practices of informal actors in relation to quality and safety?
- How do government and informal actors interact and perceive one another?
- How does the policy context affect scaling and sustainability of inclusive approaches to managing quality and safety in informal contexts, like training and certification?

Between 2018 and 2020, a survey was carried out of 431 market actors (producers, wholesalers, traders and consumers) in urban and peri-urban locations in Nairobi, Arusha and Guwahati. Data were collected through 45 key informant interviews, and literature review was carried out to inform tool design and policy review and to contextualise the findings.

With regard to policy, there was a common push for formalisation while acknowledging the importance of informality. The aspect of regulation ranged from over-regulation to 'benign neglect'. Licensing requirements in Kenya were noted to be multiple and complex. In Kenya, relationships between the informal sector and the regulator are improving, though there was mistrust during the study period. In Assam and Tanzania, the government was more tolerant of informality. However, in all countries, compliance with licensing laws was low.

Regarding policy and practice, there are several implications for governance and innovation:

- Policies are not aligned with the capabilities or incentives of actors.
- Quality and safety practices and outcomes are similar across countries despite regulatory differences.
- Informal actors may find ways to comply with new regulations that are counterproductive for safety.
- Where informal market actors are classified as illegal, they invest less in infrastructure and equipment and take fewer measures to enhance quality and safety.

Training and certification to improve quality and safety of unpackaged milk has scaled and sustained in Assam, India but not in other countries. Some of the reasons for this are:

- Realistic attitude about the continued demand for raw milk
- Tolerance of informality, even though the aim is to move towards formalisation
- Recognition of informal vendors as legitimate actors contributing to food security
- Involvement of informal vendors in the Joint Coordination and Monitoring Committee, giving them a voice and an avenue for positive engagement
- Provision of incentives for participants (certificate linked to a licence)
- Government funding

As a possible way forward, we propose the following principles of engagement: recognise informality and build on good practices; engage with informal actors and give them a voice; and invest in—rather than extract from—the informal sector.

Engaging the informal sector: experiences from Assam, India

Presenting via video recording, Ram Deka, an ILRI research scientist based in Guwahati, Assam, highlighted some experiences with engaging with the informal dairy sector in Assam through the World Bank-funded Assam Agribusiness and Rural Transformation project.

They have trained informal dairy sector actors, mainly producers, sweet makers, traders and cottage processors. All the trained actors were monitored for adoption of good practices by a committee of trained actors and by government officials using a simple tool for monitoring. Training certificates were issued to actors who adopted good practices. The certificate is a precondition for obtaining a municipality trade licence, so it acts as an incentive for training of informal dairy actors.

The training, monitoring and certification program has resulted in a number of benefits. Milk production increased by 11%. Demand for milk traded by trained actors has increased significantly compared to untrained actors. The quality of milk traded by trained actors was also significantly better than that sold by untrained actors. The internal rate of return of the initiative was 234%.

The success of the initiative has convinced the Government of Assam to scale up the program. ILRI is supporting the Department of Dairy Development to check the quality of milk by strengthening its milk testing laboratories to conduct the milk quality and safety tests as per the norms of the Food Safety and Standards Authority of India for surveillance purposes.

All the relevant government departments have been brought together under a common platform called the Joint Coordination and Monitoring Committee, notified by the Government of Assam, at state and district levels. Since informal dairy sector activities fall under different departments, the committee is taking collective action to implement the program in the field.

Principles of engagement and the African Union's Food Safety Strategy for Africa

Presenting via video recording, John Oppong-Otoo, a food safety officer at the African Union Commission, shared some perspectives on informal food markets within the context of the Food Safety Strategy for Africa that has been adopted by the African Union member states. He said that the strategy places huge emphasis on the fact that reducing the high burden of foodborne disease in Africa and tripling intra-Africa trade will largely depend on how we position the informal sector to sustainably produce and market safe food. This is because over 70% of food produced and marketed for consumption by urban communities in Africa is through the informal food systems. The sector is, therefore, critical for not just achieving Africa's food security objectives of ending hunger but also contributes substantially in terms of job creation and providing livelihoods for Africans. For this reason, we need to work together to professionalise and transform our informal markets to better manage food safety risks.

He applauded the work done by ILRI on developing the three principles that are very useful in developing interventions for the informal sector. The three principles are: (1) recognising the importance of the sector, recognising that it is capable of delivering safe food, and understanding the actors' needs in food risk management and helping them to develop realistic interventions; (2) engagement of the informal sector representation in order to understand their needs and the

policies that affect them; and (3) targeted investment in the sector which will have far reaching positive impact in terms of reducing the high foodborne disease burden and making safe food available and accessible to all Africans. Investment in capacity building will ensure that farmers and traders will be able to gain markets in regional and continental platforms.

He thanked ILRI for its years of research that led to the development of the principles and affirmed the African Union Commission's commitment to continue working with ILRI and other partners, in collaboration with member states, to raise the standards of safety in the informal food sector to enable it to continue to produce safe and nutritious food for all Africans.

Cost–benefit assessment of the MoreMilk intervention

Emmanuel Muunda gave an overview of the '*Strengthening Economic Evaluation for Multisectoral Strategies for Nutrition*' (SEEMS-Nutrition) study led by the University of Washington in partnership with IFPRI, ILRI, Helen Keller International, Results for Development, and Global Alliance for Improved Nutrition.

The objectives of the SEEMS-Nutrition study were to (1) define the most appropriate, standardised methods for measuring cost and cost-effectiveness of integrated multisectoral nutrition strategies and interventions and (2) estimate the costs and benefits, as well as cost-effectiveness, of integrated multisectoral approaches to improve nutrition and health outcomes.

For the MoreMilk project, the approach to cost–benefit assessment involved listing the activities (e.g. vendor training, follow-up visits) and associated inputs (e.g. training manuals), allocating the financial costs and estimating the economic costs. The combined financial and economic costs were then compared to the projected benefits, such as, increased profits to milk vendors, increased supply of safe milk or increased demand for nutritious safe milk.

Session 3: Solutions that scale

Professionalising informal dairy markets

George Kibet from the KDB Compliance Department briefly discussed a concept that KDB and ILRI are working on to pilot the transformation of informal milk handlers. This will involve capacity building, one-on-one mentorship, training and provision of simple milk testing kits. He noted that compliance in the informal sector will lead to a link to the formal, that is, pasteurisation and licensing.

Panel discussion: Future directions for the informal dairy sector

Moderator: Silvia Alonso

Panellists:

- Samuel Chiira (KDTA)
- Elizabeth Njoroge (MoreMilk trainer)
- Kituto Kitele (KDB)
- Joyce Bwire (Dairy Africa)

Moderator: Where do you see the Kenya dairy industry in 10 years' time?

- **Samuel Chiira:** The industry will be moving from informal to formal. There will be only one harmonised licence. Traders will be involved in value addition and receive good revenues. The industry will have grown to meet domestic demand for milk.
- **Elizabeth Njoroge:** Milk production will have increased. More women will be empowered through advocacy, gender-sensitive extension services, women-friendly credit opportunities and collaboration among stakeholders. By bridging the gender gap and empowering farmers, we will have an inclusive and sustainable dairy sector.
- **Joyce Bwire:** Hopefully, the sector will be formal. The informal sector will be growing and conglomerating towards the formal sector. There will be increased mechanisation in production. We could have a 'dairy plaza' concept in various towns offering a range of specialised dairy services. Structured finance will be needed for investment by sector players.
- **Kituto Kitele:** The dairy sector will be competitive. Processing capacity will have increased from the current level of 4.5 million litres to around 10 million litres. Annual per capita milk consumption will be at the recommended levels set by the Food and Agriculture Organization of the United Nations. There will be adequate milk cooling infrastructure in place with coolers supplied by the government. Young millennial farmers will be using technology (e-dairy). The sector will be supported with service hubs and will be transforming from informal to formal with improved quality. Traders will be scaling up, with more products and customers. Micro-, small and medium-sized enterprises will grow and realise increased incomes. All players will receive value for money, from the dairy farmer to the consumer.

Reactions from the audience

- KDB needs to win the trust of vendors.
- To ensure sustainability, there is a need to address production technologies (e.g. breeds) as these affect milk yield.
- Favourable policies will be needed. Currently, there is high taxation on agricultural processing equipment.
- We need an inventory of dairy value chain actors (producers, traders, agro-dealers).
- Nutrition should be placed at the centre of scaling up. Nutrition should not suffer at the expense of promoting agribusiness.
- As the sector formalises and scales up, there is a need to also consider increasing capacity for uptake, for example, through drying of milk.
- Farm-level extension services (feeds, animal health) are rare and need to be strengthened. The 'dairy plaza' concept for service delivery may not be as effective.

Closing statements

- **Samuel Chiira:** Formal versus informal is a matter of framework. We need to embrace affordable technology and innovation to reduce post-harvest losses of milk. A supportive environment is needed; traders ought to be comfortable with KDB. Formalisation should proceed hand-in-hand with better milk quality.
- **Kituto Kitele:** KDB is seeking to improve relations with dairy traders. The current approach is to use training, partnerships and consultations. Enforcement is the last resort. Counties are playing an active role in production as agriculture is now devolved. The Dairy Industry Bill is being reviewed to align it with the devolved function. The Food

Safety Bill is aimed at streamlining the roles of different regulatory institutions and harmonising levies for ease of business. KDB is encouraging county school milk programs and other county-based interventions through collaborative efforts.

- **Joyce Bwire:** We have to be patriotic to move the dairy sector forward so that we are able to meet local demand. Scaling up will facilitate traceability of milk and milk products. Zoning of production can also help with traceability.

Audience input: In case of a second phase of the project, what should be included?

- Greater incorporation of gender and more success stories.
- We need to understand where the contamination is happening in the different regions so as to know which value chain nodes to target.
- While the MoreMilk project was a success, there is need to focus on other aspects, for example, goal setting and mindset change. Also, how to leverage the trainers' knowledge to other counties and support trained traders to become role models and ambassadors.

Closing remarks

In closing the workshop, Silvia Alonso summed up the day's discussions by acknowledging that MoreMilk was a relatively innovative project with many players. The project achieved multiple wins and positive outcomes. She expressed gratitude to KDB for its support throughout the implementation of the project and to KDTA as a key partner. She also thanked the project's funders for providing the resources to undertake all the project activities, despite the challenges along the way. She acknowledged the government partners, non-governmental organisations and technical partners, thanking them for their interest in the project and said that she looked forward to future collaborations.

Annex 1: List of participants

No.	Name	Designation/institution
1	Shelly Sundberg	Bill & Melinda Gates Foundation
2	Joyce Bwire	Dairy Africa
3	Anima Sirma	Directorate of Veterinary Services
4	Carol Mbogo	Directorate of Veterinary Services
5	Stephen Muchiri	Eastern Africa Farmers' Federation
6	Cecilia Chepkemoi	Eldoret vendor
7	Daniel Kemboi	Eldoret vendor
8	Francisca Mutai	Eldoret vendor
9	Emmy Mugasia	Fair and Sustainable Consulting
10	Immaculate Nyaugo	Global Alliance for Improved Nutrition
11	Jef Leroy	International Food Policy Research Institute
12	Emma Blackmore	International Institute for Environment and Development
13	Annabel Slater	International Livestock Research Institute
14	Annie Cook	International Livestock Research Institute
15	Dishon Muloi	International Livestock Research Institute
16	Emily Kilonzi	International Livestock Research Institute
17	Emmanuel Muunda	International Livestock Research Institute
18	Gideon Kiarie	International Livestock Research Institute
19	Humphrey Jumba	International Livestock Research Institute
20	Ianetta Mutie	International Livestock Research Institute
21	Isabelle Baltenweck	International Livestock Research Institute
22	Sarah Ndung'u	International Livestock Research Institute
23	Silvia Alonso	International Livestock Research Institute
24	Tezira Lore	International Livestock Research Institute
25	Michael Wawire	Jomo Kenyatta University of Agriculture and Technology
26	Peter Kahenya	Jomo Kenyatta University of Agriculture and Technology
27	Paul Leparmarai	Kenya Agricultural and Livestock Research Organization
28	Judith Katumbi Ndeme	Kenya Bureau of Standards
29	Prudence Micheni	Kenya Bureau of Standards
30	Ruth Nderitu	Kenya Bureau of Standards
31	George Kibet	Kenya Dairy Board
32	Kimutai Maritim	Kenya Dairy Board
33	Kituto Kitele	Kenya Dairy Board
34	Margaret Kibogy	Kenya Dairy Board
35	Martha Mathenge	Kenya Dairy Traders' Association
36	Samuel Chiira	Kenya Dairy Traders' Association
37	Brenda Sakong	Kenya National Farmers' Federation
38	John Gachoya	Kenyatta University
39	Gerald Musyoki	Land O'Lakes
40	Charles Kibue	Ministry of Health
41	Eliud Makokha	MoreMilk trainer
42	Elizabeth Njoroge	MoreMilk trainer
43	Jonathan Kyambi	MoreMilk trainer
44	Samuel Kinyanjui	MoreMilk trainer
45	Simon Macharia	MoreMilk trainer
46	Susan Njuguna	MoreMilk trainer
47	Rahma Ramata	Rockefeller Foundation
48	Damaris Kikwai	SNV
49	Joan Chepkemboi	Uasin Gishu County Executive Committee Member
50	Stacey Katua	UNICEF
51	Catherine Kunyanga	University of Nairobi
52	Timothy Wachira	University of Nairobi

Annex 2: Workshop agenda

Time	Item
0900–0930	Introductions and welcome remarks
0930–1000	PANEL DISCUSSION: <i>The informal sector – a blessing in disguise?</i> <ul style="list-style-type: none"> • Kenya Dairy Board • Kenya Dairy Traders Association • Consumers association • Food safety expert
1000–1015	<i>Delivering impact on food safety and nutrition through the informal dairy markets: Solutions that change, sustain and scale</i> Introduction to the MoreMilk project
1015–1100	SESSION 1: <i>Solutions that CHANGE</i> The MoreMilk intervention: a training, certification and marketing scheme <ul style="list-style-type: none"> • Changes in milk safety and nutrition • Changes in dairy retailer practices • The end-user experience (success stories)
1100–1130	Break
1130–1145	Q&A
1145–1230	SESSION 2: <i>Solutions that SUSTAIN</i> Principles for scale and sustainability: policy action <ul style="list-style-type: none"> • Principles of engagement with informal markets • Cost–benefit assessment of the MoreMilk intervention
1230–1245	SESSION 3: <i>Solutions that SCALE</i> <ul style="list-style-type: none"> • Professionalising informal dairy markets • Consumer access to safe, nutritious and affordable milk
1245–1300	Q&A
1300–1400	Lunch
1400–1500	PANEL DISCUSSION: Future directions for the informal dairy sector <ul style="list-style-type: none"> • Non-governmental organisations • Kenya Dairy Board • Kenya Dairy Traders Association • MoreMilk trainers
1500–1515	Closing remarks

Annex 3: Quotes from the trained vendors

“I have seen changes when customers became many because previously, I used to sell almost 30 litres but now I sell 50 litres.”

“Before I knew how to test milk that has water added to it, I had a lactometer in my shop, but I did not know these other tests to do with hydrogen peroxide, but when I came to the training, I realized there is adulteration of milk, that is people can add other things to milk which is very dangerous to our health and health of our children.”

“Since I attended the training, nowadays I test the milk before boiling it so that I can see whether the milk is good using a lactometer and smelling.”

“I did not know that I can test milk by smelling it. These days I’m very sensitive that when the suppliers bring the milk, I smell it first before they give it to me. I smell for the natural smell of milk, pure milk. But if you get another smell which is different from that of milk, it gives a notion that something is wrong.”

“I learnt a lot about milk; my business improved, I was selling about 50 litres now I’m selling 70–100 litres.”

“Good relations with my customers. After the training, that is when I knew how to relate with my customers because previously a customer would complain about a problem with the milk and I used to be arrogant with them where I used to tell them that if they do not want my milk, they can leave it.”

“The customers increased by over 50%, those who buy milk from the shop.”

“I have been to so many trainings and you find the way the trainers give information is not so well, it makes participants leave, lose interest but the way they had invested in us in terms of teaching us how to do the presentation, the preparation, it made us very strong.”

“Keeping records. It helped me first to keep milk records so that I can know whether I’m making profit or losses.”

“In the past, I did not have confidence in selling milk because all that I knew about milk was that it is white. After the training, I gained confidence in the quality of milk that I sell. I can tell a customer whether the milk is good or not after the training, because I got to know how to test milk and differentiate between good quality milk and that which is not. I can advise the customer on the milk that has good quality to feed her child.”

“It has helped me because previously I used to sell 15–17 litres but now I can sell up to 30 litres.”

“After training, I knew the importance of keeping records. I previously did not keep records. I used to sell milk and other commodities such as bread and I used to combine the cash I got from all these together. I now separate the cash I make from selling milk and the one I get from selling the other commodities. I learnt this during training.”

“I used to buy 20 litres before, now I buy 40 litres and I sell it all.”

“I had no plans of buying a refrigerator but the training helped me until I budgeted for it. It’s almost one or two months old.”

“My customers increased by 80%.”

“I used to have few customers but when my milk quality improved, they go on telling others to come to my shop and they will find good quality milk.”

“For me, I have retained the same customers and also got new customers referred by the old customers every day and especially the new customers coming by our area, they normally buy milk from our shop because the milk is of good quality.”

“I speak to the farmers well and maintain a good relationship with them, that is why I get milk even when the other shops don’t. Milk supply has been very low.”

“I tell my customers to bring clean containers and refuse to sell milk if the container smells.”

“I make yoghurt with the remaining milk at the end of the day, which I sell for more money than regular milk and make more money.”

“I changed suppliers, and I am getting better milk now. I was able to tell the suppliers that the milk they were giving me was bad.”

“Testing the milk has made us resolve the blame game between the supplier and the farmer, whenever the milk got spoilt. This has stopped because we now use lactometers to test the milk and the suppliers do not alter the milk, they bring it just as they received it from the farmer.”

“I can say there is increase in value and stock because if I was taking 50 litres, now I can take 100 litres. Though it has been hard to get or consolidate milk, it has been of better value.”

“After the training we got to know what kind of water to use when washing the containers that we use for milk. We use warm water and rinse with running water. We also got to know that we should wash the equipment early enough so that it can dry before whoever sells you the milk arrives.”

“Some time back, a customer might come and complain that the milk got spoilt. You find that it is only one customer complaining. We ask them why it is just your milk getting spoilt or how they clean the containers and store the milk. We got to explain to the customers who complained about milk spoilage on how to store milk, how to wash the containers and maybe how to tell whether the container is fit to store the milk overnight.”

“The vendor has improved on cleanliness; hygiene has improved and it has given me the morale to keep buying milk.”

Annex 4: Selected peer-reviewed articles from the project

Alonso, S., Muunda, E., Ahlberg, S., Blackmore, E. and Grace, D. 2018. Beyond food safety: Socio-economic effects of training informal dairy vendors in Kenya. *Global Food Security* 18: 86–92. <https://doi.org/10.1016/j.gfs.2018.08.006>

Alonso, S., Angel, M.D., Muunda, E., Kilonzi, E., Palloni, G., Grace, D. and Leroy, J.L. 2023. Consumer demand for milk and the informal dairy sector amidst COVID-19 in Nairobi, Kenya. *Current Developments in Nutrition* 7(4): 100058. <https://doi.org/10.1016/j.cdnut.2023.100058>

Blackmore, E., Guarín, A., Vorley, B., Alonso, S. and Grace, D. 2022. Kenya's informal milk markets and the regulation-reality gap. *Development Policy Review* 40(3): e12581. <https://doi.org/10.1111/dpr.12581>

Galiè, A., Farnworth, C.R., Njiru, N. and Alonso, S. 2021. Intra-household handling and consumption dynamics of milk in peri-urban informal markets in Tanzania and Kenya: A gender lens. *Sustainability* 13(6): 3449. <https://doi.org/10.3390/su13063449>

Galiè, A., Njiru, N., Heckert, J., Myers, E. and Alonso, S. 2022. Gendered barriers and opportunities in Kenya's informal dairy sector: enhancing gender-equity in urban markets. *Gender, Technology and Development* 26(2): 214–237. <https://doi.org/10.1080/09718524.2022.2084491>

Girard, A.W., Adere, J., Dominguez-Salas, P., Bruyn, J. de, Kedera, E., Cyriac, S., Galie, A. and Baltenweck, I. 2021. *Nutrition, social and behaviour change strategy for dairy development programs in western and southeastern Kenya*. ILRI Research Report 73. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/114061>

Muunda, E., Mtimet, N., Schneider, F., Wanyoike, F., Dominguez-Salas, P. and Alonso, S. 2021. Could the new dairy policy affect milk allocation to infants in Kenya? A best-worst scaling approach. *Food Policy* 101: 102043. <https://doi.org/10.1016/j.foodpol.2021.102043>

Muunda, E., Mtimet, N., Bett, E., Wanyoike, F. and Alonso, S. 2023. Milk purchase and consumption patterns in peri-urban low-income households in Kenya. *Frontiers in Sustainable Food Systems* 7: 1084067. <https://doi.org/10.3389/fsufs.2023.1084067>

All MoreMilk project publications are indexed in the CGSpace open access repository, accessible via this link: <https://cgspace.cgiar.org/handle/10568/82776>