



Milk Quality and Safety Seminar

29 January 2019
Azure Hotel, Nairobi



Milk Quality and Safety Seminar

Workshop proceedings

29 January 2019

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This workshop report can be downloaded for free at <http://www.3r-kenya.org/reports/>, and <https://cowsoko.com/programs/kmdp/workshops-and-seminars/28/milk-quality-and-safety-seminar>



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Acknowledgements

This workshop was supported through collaborative efforts between 3R Kenya Project, the Kenya Dairy Board and SNV's Kenya Market-led Dairy Program and Voice for Change programs. The 3R Kenya team thanks all the participants for their valued contribution who included representatives from the dairy farmer cooperatives, dairy processing and packaging companies, service providers, county governments, national government (including government agencies), donors, research and academic institutions, milk ATM entrepreneurs, development programs and agencies, experts/resource people in the dairy sector.

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Abbreviations

CBE	Collection and bulking enterprise
CCA	Central Competent Authorities
CEC	County Executive Committee
DFCS	Dairy farmers' cooperative society
EKN	Embassy of the Kingdom of the Netherlands
FAO	Food and Agriculture Organization
HACCP	Hazard Analysis Critical Control Points
IFPRI	International Food Policy Research Institute
KCC	Kenya Cooperative Creameries
KDB	Kenya Dairy Board
KDPA	Kenya Dairy Processors Association
KeBS	Kenya Bureau of Standards
KIRDI	Kenya Industrial Research and Development Institute
KMDP	Kenya Market-led Dairy Programme
M&E	Monitoring and evaluation
MANCP	Multi-annual national control plan
MCP	Milk collection point
NFSCC	National Food Safety Coordinating Committee
NIR	Near infra-red
SNF	Solids-non fat
SNV	SNV Netherlands Development Organization
SSC Dairy	Strategic Sector Cooperation program
TBC	Total bacterial count
TIDE	The Inclusive Dairy Enterprise
TPC	Total plate count
UHT	Ultra heat treated
V4CP	Voice for Change Project

1 Introduction

The [Kenya Dairy Board](#) (KDB), SNV Netherlands Development Organization ([SNV Kenya](#))'s [Kenya Market-led Dairy Program](#) (KMDP), [Voice for Change](#) Project (V4CP) and the [3R \(Robust, Reliable and Resilient\) Kenya](#) project organized a 1-day stakeholder workshop on milk quality and safety under the theme *Fostering Safe Milk Practices for a Competitive Kenyan Dairy Sector*. The seminar mobilized stakeholders in the dairy sector to strategize on practical, efficient and sustainable strategies to improve the quality and safety of milk and other dairy products. In attendance were 132 participants from dairy farmer cooperatives and dairy farmer groups, dairy processing and packaging companies, service providers, county governments, national government (including government agencies), donor research and academic institutions, the Dairy Traders Association, milk ATM business people, development programs and agencies.

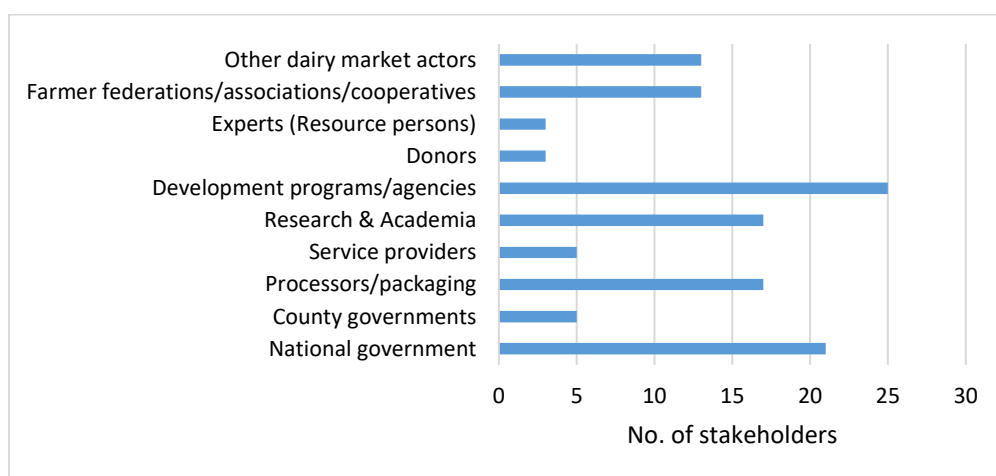


Figure 1. Distribution of stakeholder participation in the workshop

The complete list of participants is in Annex 1. Annex 2 is the program of the seminar. Presentations were followed by plenary sessions. Annex 3 is the keynote speech of Mr Harry Kimutai, Principle Secretary, State Department of Livestock.

All presentations are available at <https://www.cowsoko.com/programs/kmdp/workshops-and-seminars/28/milk-quality-and-safety-seminar>

Workshop Objectives

1. Present lessons learned from Quality-Based Milk Payment System (QBMPs) pilots and reflect on scalability potential
2. Highlight ongoing public and private sector efforts in the sector on the agenda of milk quality and safety (research, policy and practice)
3. Discuss opportunities and threats in driving a quality-based industry/sector
4. Deliberate on next steps and potential for building a community of practice to champion the realization of safe and quality milk and dairy products.

1.1 Opening remarks

This opening session was facilitated by Mr. Philip Cheronno of the Kenya Dairy Board.

Mr. Emmanuel Kabaki, the procurement general manager at Brookside Dairy, in his opening remarks explained in detail the quality and safety issues in the milk they buy from the 165,000 dairy farmers spread across Kenya. Brookside Dairy has been processing milk for the last 25 years and only accepts milk that meets its set minimum quality standards. The processor is committed to paying their farmers based in future. He emphasized the importance of an open discussion among stakeholders on how to improve milk quality and safety.

Mr. Albert Mwaniki, the CEC for Livestock, Murangá County, also mentioned some of the quality and safety issues of milk in the county. Murangá County has invested in milk coolers and farmers are getting premium prices for their milk, adding that self-regulation is needed in the sector to improve milk quality and safety.

Ms. Margret Kibogy, managing director of the Kenya Dairy Board, gave a detailed presentation on the history and operations of the KDB, its responsibilities as the apex body of the milk sector in regulating, developing and promoting the dairy sector. She stressed that every player in the milk industry is expected to play their role if milk quality and safety are to be achieved. She called on stakeholders to work together to move the dairy sector forward and assured them that KDB will invite them to validate the regulations developed for the sector.

Sanne Willems is the First Officer, Food Security and water at the Embassy of the Kingdom of the Netherlands (EKN). EKN is one of the development partners in the sector as well and provides financial support to SNV's Kenya Market-led Dairy Program (KMDP) and the 3R Kenya Project under which studies on milk quality and the QBMPS were conducted. SNV has been supporting the Kenyan dairy sector since the 1980s at that time focusing on zero grazing units, and later strengthening several other value chains. In the last few years, the KMDP has been working on feed and fodder, animal husbandry and milk quality under KMDP. She said there has been a notable change in the dairy sub-sector since milk quality issues are featured in the press more often hence the need to have a frank and open discussion on milk quality issues. She also noted there is opportunity to upscale the QBMPS because the government and NGOs are already working on milk quality improvement. She reasoned that the cost of testing milk for quality could be high but the cost of treating milk-borne infections is even higher.

Kenya produces annually 5.2 billion litres; of these 4.1 billion litres are from cows. There are 390 milk coolers with an installed capacity of 3.4 million litres, yet only 50% (1.7 million litres) of this daily capacity is used. The 25 milk processors handle and use only 659 million litres (about 40%) per year of the installed capacity: 70% of the milk produced is handled by the informal sector. Milk is marketed and sold by milk processors, mini dairies, milk bars and milk ATMs.

During this session, the presenters explained in detail how milk gets contaminated along the value. Milk quality and safety are compromised on all nodes of the dairy value chain—from the farm to the table. Understanding the dairy value chain and how each actor affects milk quality is important. Deliberate unethical practices among industry players affect milk safety and quality soon after milk leaves the udder. Milk handling starts at the farm, and its quality is compromised by the health of the cow (mastitis), unhygienic milking and handling practices

and poor storage (use of non-food grade containers and equipment to store milk and sell it. Farmers have a common milk collection centre and use varying hygienic handling practices, and sometimes non-food grade containers and equipment are used to store and transport milk.

Milk is adulterated with water and other solids to increase the density, volume and fat content, preservatives are added to prolong the shelf life and sometimes to minimize the cost of production; farmers, animal health practitioners and service providers misuse antibiotics, and farmers fail to observe withdrawal periods. Many farmers are unaware of the presence of aflatoxins in feeds purchased. The consumer market ends up with milk that is adulterated, has antibiotic residues and aflatoxins from the use of commercial animal feeds contaminated with aflatoxins.

Rapid test kits for antibiotic residues are expensive, averaging at Kenya shillings 600 for every 6 litres of milk tested. Until recently, these rapid test kits were not even available in the market. Testing milk for individual farmers with rapid test kits is expensive; bulking milk in milk cooling centre lowers testing costs. Inadequate pasteurization has also left the market with unsafe milk products.

1.2 Solutions proposed

- Pass and enforce regulations enforcing actors to comply with milk quality and safety standards.
 - Individual dairy producers must take responsibility for complying with milk quality and safety standards. Farmers can be trained on milk handling hygiene when they deliver milk to a milk collection centre.
 - Observing hygienic practices along the dairy value chain is critical to reducing bacterial count and prolonging its shelf life; all actors across the chain must ensure milk is hygienically handled before it gets to the consumer.
 - Safety and quality issues are not only for export products but also for products consumed in the domestic market.
- Regulate and control the manufacture of animal feeds and flag feeds contaminated with aflatoxins.
- Find ways to minimize the high cost of production to make the dairy sector more competitive, and reduce imports from other countries. High production costs, including the cost of testing milk, is also one of the causes of milk adulteration by actors to improve profit margins.
- Educate and inform consumers about milk quality and safety issues so that they demand for the same.
- Collaboration is important among all dairy value chain actors and those in the dairy sector at large such as national and county governments and regulatory agencies to ensure actors along the value chain comply with milk quality and safety standards.
- National and county governments should provide the enabling environment including a regulatory framework that addresses milk quality issues, adequate milk testing infrastructure, sufficient extension services and dispute resolution mechanisms.

1.3 Key note address by Mr. Harry Kimtai, Principal Secretary, State Department of Livestock

Mr. Kimtai outlined the importance of the livestock industry as a source of sustenance and livelihoods for communities in Kenya, and the base of one of the most progressive dairy industries in Africa. Problems of milk quality started when the formal milk market collapsed in 1992. Poor milk-handling practices compromised milk quality and safety standards, a situation that has been exacerbated by the lack of extension services and unethical practices by milk handlers. He hailed this important stakeholders' forum that is discussing milk safety and quality.

The government is supporting the sector through creating an enabling environment by strengthening the policy framework that will ensure quality and safety measures are in place:



Mr. Harry Kimtai, PS, State Department of Livestock
(Credit: Chams Media)

- It has developed the Food Safety Bill to operationalize the Kenya Food and Drug Authority
- 300 milk coolers have already been distributed to organize milk cooling and marketing; and more milk coolers will be bought. Rapid milk testing kits will be procured to accompany the milk coolers to test milk before it is bulked.
- The National Dairy Regulatory Laboratory has been constructed for the Kenya Dairy Board at Kabete for testing levels of compliance, and is expected to start analysis at the end of 2019.
- The Veterinary Policy is awaiting cabinet approval and will address problems of antibiotics residues in food products.
- The National Livestock Policy has also been reviewed, which, among other livestock issues, will address milk safety and quality, such as the quality of animal feeds especially presence of aflatoxins in feeds.
- The new/revised Dairy Industry Regulations (2019) are expected to be enacted in the course of 2019. It enhances sector regulation and standards for enhanced milk quality and safety, amongst others through introduction of milk quality payment systems.

Mr. Kimtai noted that despite early hitches, collaboration between the national and county governments on livestock issues is now moving smoothly. It is in the interest of county governments to strengthen agriculture and the livestock sectors because the two sectors provide livelihoods to communities and the counties derive revenue from the industry. He advised stakeholders to embrace cooperation, self-regulation, the QBMPS, and capacity building for farmers to impart skills that will improve milk quality and safety.

2 Objective 1: Overview of quality-based milk payment systems (QBMPS) and lessons from a pilot in a small-holder context and potential for scalability in Kenya

Fostering safe milk practices for a competitive dairy sector—Overview of principles and practices

Martin de Jong, Technical Director at Bles Dairies Consultancy, Netherlands

Martin de Jong gave an overview of the different approaches to introducing the QBMPS. His presentation focused on parameters used to determine quality of milk, QBMPS elements and success factors as well as international experiences, proposed milk acceptance and payment criteria and adulteration issues.

Milk quality comprises three aspects: its composition (butter fat, proteins, solids), microbial load (TPC, coliforms, somatic cells) and foreign matter (added water, added solids, preservatives, antibiotic residues, aflatoxins). Constant raw quality milk can be achieved by providing a financial incentive to farmers and this is what a quality-based milk payment system (QBMPS) does.

A QBMPS also confers benefits such as safety assurance to consumers, an incentive to farmers to produce quality and safe milk, increased shelf life, and makes the dairy value chain more competitive by meeting export standards.

A QBMPS pays bonuses for high quality milk from penalties deducted from low quality milk. Countries that have introduced payment directly linked to milk quality have reduced the average bacteria count and improved milk composition. In the end, all QBMPS should lead to increased profits in the dairy value chain.

Kenya's dairy sector could borrow a leaf from countries leading in the implementation of the QBMPS, for instance in the adoption of urea tests, taking lactose content into account, ingredient tracing, auditing of the payment system and implementing the FAO guide and Hazard Analysis Critical Control Points (HACCP) principles in dairy farming practices. All stakeholders in the entire dairy value chain should be concerned about milk quality starting from the farmer to consumer and everyone in between including government regulators.

Characteristics of a QBMPS

The key elements in a QBMPS are: selected quality parameters, sampling (how, where, when, frequency), testing methods (reliability, ownership of testing facilities), who pays for testing, price level for each parameter, awareness creation, communication of test results, handling complaints, technical support and training. The raw milk supply chain is not free from common adulterations—addition of preservatives, neutralizers and added solids—to cheat the system, hence the milk processor must TEST for those adulterants. At the introductory phase, the QBMPS design should be simple and be based on a limited number of parameters both for milk acceptance and milk payment, and the prevailing milk market price should be the starting

point. The processor sets its own price level for the parameters it considers important. Appropriate testing and sampling equipment should be available as well as written standard operating procedures. Table 1 shows different parameters considered for QBMPS in select countries.

Table 1: Elements of milk quality considered in QBMPS in select countries

Country	Element of milk quality considered
Netherlands	Fat, total solids, TPC, Somatic cells, purity, butyric acid, freezing point, antibiotics, aflatoxins
Kenya	BioFoods Ltd: uses the stringent Netherland’s system Happy Cow: TPC, antibiotic residues, freezing point, total solids, somatic cells, aflatoxin M1 Brookside: to start soon: fat, total solids, antibiotic residues
Indonesia	Density, fat, total solids, proteins, pH, TPC
India	Fat
Rwanda	TPC, SNF
Zambia	Fat, SNF, TPC

Lessons in implementing a QBMPS

- Introducing and implementing a QBMPS is a marathon not a sprint – there is no one giant step that does it; it comprises many little steps.
- Training and education have not had a long-term effect on achieving constant raw milk quality at farm levels— a financial incentive or penalty related to raw milk quality will have more impact.
- QBMPS is not the goal, but it is the means to achieving the goal of producing milk from healthy cows and providing safe milk and milk products to consumers in the most economical and transparent way.
- QBMPS is only a system whose effects are driven by people not legislation; hence all stakeholders must own the system and underwrite its need.
- People must have the discipline to follow the system.

2.1 QBMPS Pilot

Happy Cow Ltd, a local Kenyan processor has been piloting a QBMPS in its smallholder dominated supply chain. The pilot was supported through SNV- Kenya Market-led Dairy program with funding from the Embassy from the Kingdom of the Netherland.

Below, we summarise Happy Cow’s experiences with implementing the pilot. This is followed by results of a collaborative effort between 3R Kenya project who partnered with Happy Cow and SNV’s KMDP to conduct research to document and assess systematically the experiences, outcomes and lessons of the pilot.

2.1.1 Case 1: Happy Cow’s experience with piloting a QBMPS in a complex smallholder milk supply chain

Gerard Oosterwijk, Director, Happy Cow Ltd.

The presentation outlined QBMPS pilot partnerships, the zero-setting baseline with regard to milk quality and collection practices, challenges to milk quality and safety assurance, sampling regime, testing and payment criteria, project interventions, main achievements and

bottlenecks in the implementation of the QBMPS pilot, lessons learnt and opportunities for scaling up.

Happy Cow is a local dairy processing company that started in 1996. It specializes in making various cheese types and fermented milk products. In 2016, Happy Cow partnered with Olenguruone Dairy Farmers Cooperative Society (DFCS) and New Ngorika Milk Producers Ltd. with financial support of SNV's [KMDP](#) to introduce a quality-based milk payment system (QBMPS). Happy Cow shared the practical lessons they have learnt from this experience. The challenges common in rural areas that hamper milk quality and safety assurance are the large number (1.5 million) of small-scale producers, poor roads, poor water quality, inadequate cold chain, unethical practices, informal milk traders, milk bought on volume instead of quality. The specific safety challenges in milk produced were use of hydrogen peroxide to prolong shelf life, presence of antibiotic residues, adulteration and high bacterial count due to lack of proper hygiene practices, and late collection of milk coupled with inefficient milk coolers that act more as incubators than coolers, and take long to cool milk to the required 4°C.

The project intervened and set up laboratories and several milk collection points, it used instant milk chillers together with milk coolers, encouraged the use of aluminium cans and used treated water for washing the cans, and trained all milk handlers. Happy Cow developed a software that links individual farmers to their milk can or milk collection point (MCP). The cans are tested randomly on quality parameters at Happy Cow's laboratory twice a month and all project cans must pass all acceptance tests every day of the month at the dairy cooperative.

Testing milk samples under the QBMPS

Happy Cow laboratory tests for: total bacterial count (TBC/TPC), presence of antibiotic residues, adulteration / freezing point, total solids (including fat, protein, lactose and ash), and in 2018 started testing for somatic cell count and aflatoxin M1.

The financial benefits are reduced processing costs for processor and fewer ex-market returns, improved income to farmers through bonus and reduced rejections, and the expansion of the export/trade market. The health benefits are product shelf life is prolonged, product quality has improved and food safety for better health is guaranteed. With these achievements, the QBMPS is high on the national agenda. The Kenya Dairy Board and Kenya Dairy Processors Association are already strategizing on it, total solids and incidence of adulteration have been brought within standards, and the Kenya Accreditation Service has accredited Happy Cow's laboratory.

Lessons learned

Implementing a QBMPS. Implementing a QBMPS requires time because behavior change takes time. All stakeholders must take responsibility for the QBMPS to succeed.

Start small such as through tracking and tracing milk through can ownership. Be cautious when 6–7 farmers are bulking milk into the same milk-can because farmers have different practices and milk quality can be compromised. Testing each can does not immediately identify the specific farmer(s) whose milk does not meet the required standards, unless farmers who bulked in that milk-can are visited for testing at the farm level as a follow-up.

Assessing many QBMPS parameters has been tedious and expensive for Happy Cow. For example, reducing levels of total plate counts is essential, but the process is slow. Farmers must work to increase productivity and hygienic handling practices instead of complaining about price.

Informal vs formal players. Competition among informal sector players and processors limits the success of implementation (e.g. rejected milk is taken to competitors). Dairy cooperatives should work together to standardize operations and empower farmers. Cooperative leaders must be committed to the sector.

Processors. Milk processors must invest in extension services to build capacity of farmers and follow up on milk quality challenges at farm level.

Processors do not have a common strategy on milk quality in a market that is driven by volumes instead of quality. It is difficult to have a price neutral QBMPS in Kenya (where penalties raised are used to pay for bonuses) because farmers will easily switch to another milk buyer if penalized for poor milk quality.

Processors must be part of the solution, they should reject all milk delivered in plastic containers and should stop receiving milk delivered after 10.00 am because by this time the milk quality has been compromised. Cooperatives must empower their members to produce quality and safe milk and the farmers should also be willing to invest in quality.

Milk storage, transport and preservation. Infrastructure and milk quality polices are currently inadequate. Plastic containers must be eliminated for storing milk because they are difficult to clean and sanitize, leading to high bacteria load. Milk cooling tanks in Kenya are ineffective because they act more as incubators than coolers. They must be used in combination with instant milk chillers or plate heat exchangers to increase their effectiveness.

Milk quality testing facilities: Quality checks should be carried out at the various nodes along the dairy supply chain: at milk collection points by graders, acceptance tests before bulking at the collection and bulking enterprise (CBE) and by processors. Each cooperative must own a fully equipped laboratory for testing milk.

Regulators. Collaboration between dairy value chain actors and regulatory agencies is necessary to assure milk quality and safety. Regulators must enforce regulations and formulate policies that advance the dairy sector. Incentives such as premium pay and enforcement of regulations are key to success.

The veterinary board should control the unregulated sale and use of antibiotics among farmers and animal health practitioners, which leads to the problem of antibiotic residues in milk.

Consumer awareness. Consumers should be informed about safety and quality issues, so that they can demand quality milk products.

Plenary

Timing of delivery: Timing is an important element in milk collection. Because the government is continually investing in milk coolers, timetables for milk collection should be developed at each milk cooling station. Farmers should be advised to milk close to milk collection times; this calls for close collaboration between farmers and cooperatives. CBEs need to be well organized to deliver milk at specific hours for cooling; farmers and CBEs need to agree on the time of milk delivery.

The problem with temperature: Total bacterial count (TBC/TPC) in milk is high because in addition to unhygienic handling practices, the current milk coolers are essentially incubators and are ineffective in cooling to the required temperature of at least 8°C. Large-capacity milk coolers need instant milk chillers to reduce the time it takes to cool milk. Research should come up with a cooling technology that works for the sector. Farmers who chill their own milk should make arrangements with processors to test their milk on site and compensate them because processors are assured of a quality product.

Strengthening dairy cooperatives: County governments and stakeholders must strengthen dairy cooperatives to make them self-regulating and enforce milk quality among members. Dairy cooperatives must own milk testing facilities to implement the QBMPS. CBEs should also be made aware of the importance of investing in a laboratory and trained in its use to ensure that milk delivered is tested.

Sustainability of QBMPS: The sustainability, especially of the pricing, of the QBMPS is a concern. For processors, analyzing quality of milk is expensive and raises the total costs of the system significantly. Once all issues, including the high costs of implementation are addressed, the system could be sustainable in the long term.

Transport: Transport delays can be caused by any player along the dairy value chain; transport is made worse by poor roads and vehicle breakdowns. Again participants recommended time scheduling for morning and evening milk. Transporters cannot take the blame solely because even when they are at the farm gate on time, the farmer has not milked yet. Sometimes transporters are not able to carry all the milk at once, and milk is left on the roadside to be picked later.

Formal vs informal milk trade: Informal milk traders give better prices because they do not have overhead costs like dairy cooperatives. Cooperatives need support from regulators to remove unfair competition from informal traders. Processors and their association, the Kenya Dairy Processors Association (KDPA), should upscale the implementation of the QBMPS in more areas to open markets and give more dairy farmers incentives to produce quality milk, and avoid the informal market. KDB should also lobby to have the informal sector source milk from dairy cooperatives or milk processing factories to ensure the milk they trade has gone through the necessary quality and safety checks. And they should also be trained in hygienic milk handling.

Awareness creation and information asymmetry: Awareness and training should be increased in the village dairy farms so that farmers are informed about the sources of aflatoxins and antibiotic residues and how to prevent them in milk. Laboratory results should also be communicated to the farmers to influence behavior change towards quality and safe milk production.

2.1.2 Case study: 3R Kenya Project—Implementing a QBMPS in a smallholder supply chain—Evidence and lessons from the Happy Cow Pilot

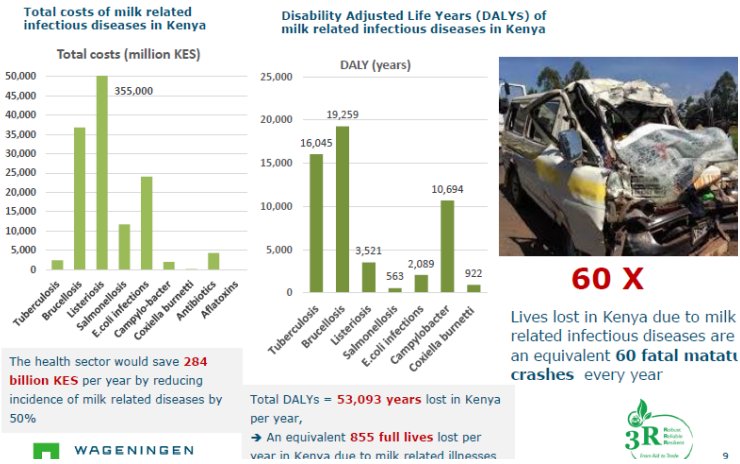
Dr. Asaah Ndambi, WUR–Livestock Research

This 3R Kenya presentation by focused on the successes and challenges in the technology practice, the business case and the value chain. The successes of the technical practice were that testing and services were brought closer to farmers at different sampling points—farm,

collection point, CBE and processor. Graders were equipped and a mini laboratory was constructed at each CBE, most farmers shifted to using aluminium cans, better milk chillers were installed and antibiotic residue levels generally went down.

Supply chain successes include maintaining a price difference with other competing buyers, maintaining loyalty from CBEs (in relation to milk volumes), and low milk rejection meant that more farmers qualified for bonuses. The challenges were MCPs were not used, there were inconsistencies in can ownership, difficulties in separating morning and evening milk and the clocking system did not work as anticipated as deliveries were still late.

Business case: Public health costs and benefits



For the business case, the QBMPS is beneficial to all value chain actors, though farmers are the biggest beneficiaries. Though initial costs are high for both processors and cooperatives—laboratory analyses and farmer training, software development, project management and staffing, bonus payments and hardware—the long-term costs are minimized as milk volumes and quality increase, thereby increasing revenues and reducing rejections.

Public health benefits

Health costs are significantly reduced by reducing incidents of milk-related illnesses and lives lost; the health sector would save up to KES 284 billion per year by reducing milk-related illnesses by 50%. Each year an equivalent of 850 lives are lost in Kenya due to milk-related illnesses (equivalent to 60 fatal matatu crashes (loss of full lives) a year).

Knowledge transfer and creating new knowledge

A local team has been trained and therefore knowledge is being retained. Happy Cow also developed a database and software for milk quality tracking and tracing, which enabled Happy Cow to collect and record details on milk quality over time which is useful for the sector. The public sector also showed interest in the pilot and were open to learn from the process.

3 Objective 2. Public and private sector efforts for milk quality and safety (research, policy and practice) in the sector

3.1 Case 2: BioFoods Ltd QBMPS approach

Jasper van den Brik, BioFoods manager of business planning and development,

Jasper gave a brief summary of BioFood's profile, approach to quality and safety assurance, quality challenges and solutions, underlying threats to the dairy sector that limit high quality milk production and BioFood's recommendations.

BioFoods Ltd. supports its farmers to produce good quality milk by walking with them until they attain the set standards before they start collecting milk from them. BioFoods Ltd. collects milk from medium and large-scale farmers who produce 500 litres of milk and above. The processor has grown its milk volumes by 300% in the last one year. This is largely attributed to relying on market research and using SNV's networks to access good quality milk from farmers trained under SNV's KMDP program. BioFoods has strong networks with farmers who can supply quality milk that meets its standards and the processor is now targeting such farmers who are located in Eldoret to upscale. The three milk quality challenges are aflatoxins, antibiotics and high TPC.

BioFoods success lies in collecting individual farm milk; testing milk before accepting it; making extensive preparations—farm audits, milk sampling, lab analysis and training before engaging farmers; training farmers in hygienic production and milk handling practices; and the QBMPS. However, these solutions have come at a high cost.

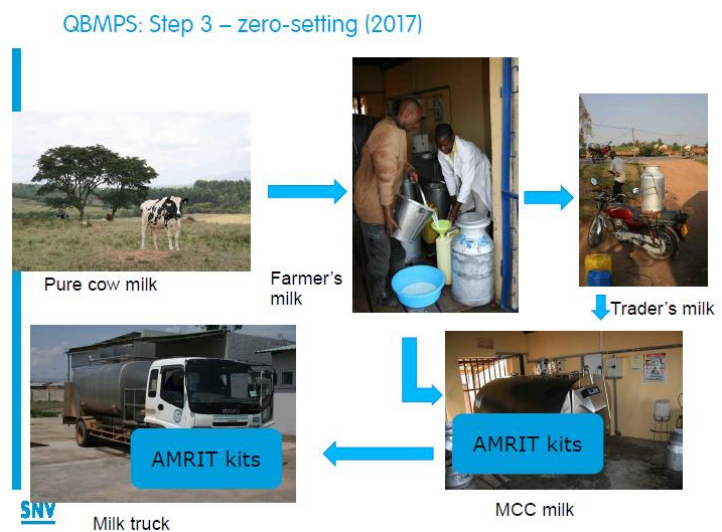
The system is not without threats from unsustainability of the dairy farming business due to the long cash conversion cycle, high capital investment with low returns on investment, and the business is unattractive to the younger people. There is also a disconnect between quality and pricing: there are no returns on investment and the high cost of individual milk testing.

BioFoods recommends improving sustainability through avoiding price fluctuations, investing in knowledge and awareness, creating incentives such as paying more for high quality (QBMPS), using near infrared testing methods to reduce the high cost of testing milk using traditional techniques, and using cooperatives instead of testing milk from individual farmers.

3.2 Case 3: Lessons from Uganda on QBMPS – TIDE Project (The Inclusive Dairy Enterprise)

Rinus van Klinken, SNV TIDE project

The TIDE project got buy-in from three types of milk processors: a large-scale dairy processor, a medium-scale processor and a small-scale processor. TIDE set the QBMPS parameters on milk composition as fat and solids-not-fat, and disqualified milk if it was not fresh or was adulterated. Three milk payment categories were based on these criteria: Category A received a bonus of 10%, Category B did not receive a bonus, and Category C milk was rejected (or even penalized). There was zero testing for baseline data (zero-setting), and milk was tested for payment. A problem common among all QBMPS pilots was the difficulty in measure the quality of milk from each farmer. The milk collection centres (MCC) had collective responsibility for the quality of milk farmers delivered and for paying or not paying bonuses to farmers. MCCs in Uganda have fewer farmers, about 50–60, than in Kenya. The pilot also had a problem-solving team made of the Dairy Development Authority and the national regulator that would visit MCCs to help when there was a problem, such as assessing bacterial load.



Steps in implementation of the QBMPS. 3rd step; zero-setting. (Credit: Rinus van Klinken; TIDE (SNV, Uganda))

The project had interesting results. Milk quality improved and stakeholders are satisfied with the pilot results. Rather than side-selling when their milk did not attain the required quality, farmers wanted to know what they could do to earn the 10% bonus! Farmers have moved away from farming milk as a by-product and are now more commercial oriented. The QBMPS has contributed to this sector transformation.

Collaboration between stakeholders was efficient and appreciated. Different partners were allowed to join the project. The position of the Dairy Development Authority was strengthened by co-leading the pilot with SNV, whose support was appreciated by stakeholders. These innovative processes have contributed to the success of this pilot.

Lessons learned

QBMPS is an intensive process requiring awareness and training as it touches on national regulation, milk procurement policies and collaboration among value chain actors. The pilot had set up milk collection centres, testing at various points along the value chain and reported bi-weekly to farmers on their bacterial and coliform counts.

The 10% bonus was definitely an incentive for the farmers to ask how they could improve milk quality. The financial incentive is important if a QBMPS is to be successfully implemented.

TIDE project managed to eliminate some of the vices in the value chain: milk density was at 1.026 g/mL but the project worked at eliminating adulteration with water and the acceptable density at the moment is 1.028 g/mL, as required by the East African milk quality standards.

Compared with the Kenyan pilot, the QBMPs pilot in Uganda has worked well because farmers are becoming more professional and business oriented. The onus to ensure that milk is of high quality is on the milk collection centre that bulks milk as it is difficult to trace each farmer. In addition, instant coolers are more available and processors in the Uganda pilot were willing to invest in the system. With these transformations, Uganda is now the leading exporter of milk in Africa after South Africa, and is setting its eyes on beating South Africa soon. TIDE is now discussing the future of the project after the pilot.

3.3 Strategic Sector Cooperation Program of DANIDA

Henning Nygaard, Counsellor at the Royal Danish Embassy

Henning Nygaard manages the Strategic Sector Cooperation program and oversees the Danida Agri program at the Embassy. The Danish Ministry of Foreign Affairs and the Environment and Food Ministry together are involved in the Food Safety Organization that was recently set up in partnership with the private sector to transfer knowledge of food safety to its partners. Kenya is one partner and together they are working generally on quality food safety control systems and brings together the ministries of Health, Agriculture and Industry and institutions related to these ministries.

The Strategic Sector Cooperation program (SSC Dairy) has several partners in Kenya: Two Kenyan private milk processors, regulators (the Kenya Bureau of Standards (KeBS for milk testing and analysis), Kenya Dairy Board (for standards and guidance on safety issues and linkages with KDPA) and Directorate of Veterinary Services plays an advisory role on animal health—use of antibiotics and withdrawal period. Danish expertise is heavily involved in knowledge transfer. The program is not just for the dairy and horticulture value chains but covers all aspects of food safety especially in the counties.

Nyandarua was chosen as the pilot county. In the first phase the programme worked on horticulture and dairy value chains. Emphasis was on food business operators. Processing practices were also reviewed and standard operating procedures were developed for can washing and milk ATM dispensers. He asked processors to come together under their umbrella organization to develop common rules of operation.

After a first 2-year phase, the program is now moving into a second phase and is addressing feeds and reference laboratories and a few other areas. It has a massive training programme and this year more than 100 Kenyans will be sent to Denmark to train in various specialized short and long term courses on food safety. It is also working with Central Competent Authorities in pilot counties—through the clean milk hub concept (see reflections below). But law enforcement is another important aspect in food safety that the country should consider.

3.4 Reflections from Nyandarua County on improving milk quality and safety: The clean milk hub experience

Dr. James Karitu, CEC - Agriculture, Livestock and Fisheries for Nyandarua County

Nyandarua County is expansive and takes up a third of the former Central province. There are 165,000 households in the county and 65% of these rely on agriculture, especially dairy and Irish potato farming, for their livelihoods. With a dairy herd of 346,000 cows, annual milk production is 344 million litres, though the county has the potential to produce 700 million litres per year. The county is working to improve productivity in milk through providing extension services, subsidizing artificial insemination services through a public-private partnership, controlling animal diseases, establishing fodder banks, and improving the road network because poor roads are a major cause of delays in milk deliveries to CBEs.

Under the SSC dairy project, the clean milk hub worked in Nyandarua County from the farm to the market to improve milk safety and quality. All the players in the dairy value chain—farmers, transporters, cooperatives, processors and consumers—have a role in ensuring milk quality. However, the training and testing initiatives did not improve milk quality, clearly another strategy is needed to improve it. It is important to enforce regulations that support compliance with quality and safety standards.

IMPORTANT FIGURES

- **11 billion shillings**-contribution of dairy to county GDP
- **346,000**-estimated dairy cattle population
- **344 million liters**-current milk production estimates
- **700 million liters**-production potential
- **143,000**-total number of estimated households in the County
- **65%**-Percentage of households in dairy farming

3.5 Multi-Annual National Control Plan (MANCP) – Reflections from the National Food Safety Coordination Committee

Robert Kilonzo, Ministry of Health

The Central Competent Authorities (CCA) is the government regulator working closely with the Royal Danish Embassy under the Strategic Sector Cooperation program to develop a Multi-Annual National Control Plan (MANCP). This plan an integrated procedure that guides the performance of official controls by competent authorities through enforcing, monitoring and verifying compliance with relevant requirements of food laws and regulations by food and feed business operators at all stages of production, processing and distribution. Danish experts are helping CCA to reorganize and critique the way organizations are working to remove overlaps and conflicts, and identify who is best suited to carry out specific roles. The CCAs are also developing regulations separately for animal commercial feeds from plant origin and from animal origin.

Each CCA will prepare annual reports to the National Food Safety Coordinating Committee, once the MANCP has been developed. These reports are a way of regulating food safety standards. As a control agency, the Kenya Food and Drug Association (KFDA) will regulate and control the other CCAs. Under the MANCP, food and dairy business operators will be

responsible for food safety and quality; regulation will be risk-based to avoid wasting resources. A draft MANCP and strategy are ready and will be shared with the sector stakeholders.

MANCP is a national food safety quality system anchored in our National Food Safety Coordinating Committee. It covers food and feed laws, legislations on animal health and animal welfare as well as phytosanitary legislation. It is not an accreditation system, but a plan to assist regulators ensure veterinary safety, plant health and food safety through regulation by placing the responsibility of food safety on food business operators.

To control antibiotic residues in milk, the dairy industry should develop a national residue control plan and agree on which residues to focus on. Nyandarua County supports the roll out of the QBMPS because it will assure milk safety and quality, and will benefit farmers.

3.6 Some research insights on milk quality issues in Kenya

This objective had a panel discussion to provide insights from research on milk quality and safety, the evidence and potential solutions. Panel members were Prof. Bockline Bebe (Egerton University), Mr. George Wanjala (KIRDI) and Dr. Vivian Hoffman (IFPRI).

3.6.1 Milk quality and safety in Kenya

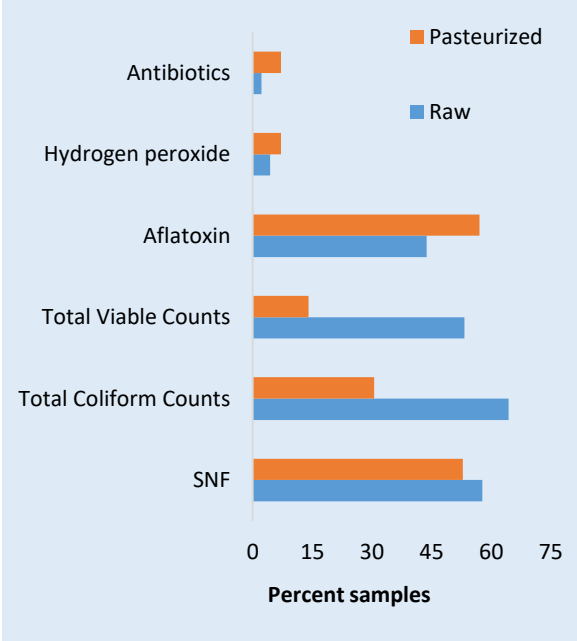
Prof B Bebe, Egerton University

Based on a study carried out by 3R Kenya project in five Kenyan towns, non-compliance is prevalent. Milk samples had very high levels of aflatoxins, bacterial load and SNF, but were relatively lower in antibiotics and hydrogen peroxide. No distinct quality advantages were seen between raw and pasteurized milk, and ATM and packaged milk, but ATM milk offered some quality advantages over raw milk from plastic containers.

Raw milk was purchased more than packaged milk, UHT milk and mala (sour milk) and yoghurt. Price was the most important consideration in purchasing milk. Consumers perceived risk exposures to be very high in mobile traded milk, though in reality packaged and ATM milk are equally risky.

Communicating risk education to the public

The prevalent themes in the print media articles are **causes of unsafe milk** (poor hygiene or poor quality feeds), and **innovations for improving milk safety** (milk coolers and



No distinct quality advantages were seen in pasteurized milk compared with raw milk, contrary to consumer perceptions. (Credit: Prof. Bockline Bebe; Egerton University)

pasteurizers). But despite the risks posed by milk traded in the formal and (especially) informal market, articles in the print media do not communicate this risk.

Recommendations

To achieve quality and safe milk for a competitive dairy sector requires:

- Investing in educating milk producers, processors, distributors and consumers by targeting prevalent concerns and hot spot risk segments of the value chain, introducing mandatory skills and knowledge certification; addressing unethical behaviors in the milk business and partnering with the media in communicating risk status.
- Investing in a national milk reference laboratory to consistently test field samples; sanction non-compliance, and consider a reward scheme for consistent compliance.
- Promoting business group self-regulation by replicating what has worked in other sectors, such as the NTSA approach in the matatu sector through cooperative governance.
- Instituting pooled cooling/chilling facilities for mobile traders to improve milk quality and safety
- Strategically engaging supermarkets and milk ATMs in enhancing quality and safety of traded milk
- Actively engaging and partnering with universities to monitor and report risk status, research and map prevalent concerns and hot spot risk segments; educating milk producers, processors, distributors and consumers

3.6.2 Recent findings on milk safety in households

Vivian Hoffmann, IFPRI

A market-to-mouth study done in low income peri-urban Kisumu in households with children aged 9 months had the following results:

- 69% of mothers bought UHT milk for their infants because it is convenient and probably because of the high perceived safety of UHT milk
- Potential pathogens were found in all vendor samples: raw milk, fresh packed milk and UHT milk
- Household practices are mostly ineffective at reducing bacterial contamination and introduce additional bacteria



Vivian Hoffman sharing research findings on market-to-mouth study (Credit: Chams Media)

It is unclear why bacteria are common in processed milk; further research is needed to identify their entry point and appropriate corrective action.

Better food safety practices are needed in the home thorough cooking, boiling, hand washing, and safe storage. Consumers should also be advised to boil pasteurized and UHT milk because how they handle the milk once the seal is opened compromises its quality.

3.6.3 Quality and safety of milk in Nairobi: Evidence and potential solutions, by G. Wanjala, Research Scientist, KIRDI

The presentation highlighted the threat posed by antimicrobial resistance to public health, food safety, food security and livelihoods. Raw milk from the udder of healthy, well-fed animals is virtually sterile, but poor hygiene and bad husbandry practices expose cows to infections and so antibiotics are needed.

Attention should be paid to feed quality and safety for example through improved feeding and early detection (through testing) of feeds, to reduce contamination of milk with aflatoxins.

The 'One health approach' promotes synergy between environment health (for example, observing proper hygiene of the milking parlour), human health and animal health (reducing incidence of mastitis) in quality and safety assurance—the three dimensions key to transforming the dairy sector. The Danes and the Dutch have reduced the use of antibiotics by nearly 80% by practising better hygiene on their dairy farms and using vaccines. Dairy farmers should practise better hygiene in the dairy farms, replace antibiotics with vaccines, use antibiotics responsibly and observe withdrawal periods for any antibiotics used on the farm.

There is also a need to invest in surveillance and research to measure progress towards mitigating anti-microbial resistance.

Plenary

The presence of *Listeria* and other microorganisms in pasteurized milk is a concern. UHT is ultra heat treated milk and destroys microbes and should therefore be sterile. A potential point of contamination of UHT milk could be how it is handled once the seal is broken. Even where they perceive some brands to be safe, consumers should be informed on proper milk handling.

Informal milk traders should also be trained in safe and hygienic milk handling. Many actors including dairy farmers, milk traders, cooperatives and milk processors adulterate milk with water to increase volumes and profit margins. Low milk prices are an important factor contributing to milk adulteration. Implementing the QBMPS will reduce incidence of adulteration as milk will be paid for its quality and not for volume.

Antimicrobial resistance is a hazard to human health and should receive more attention. Reducing use of antibiotics, e.g. by replacing them with vaccination, should be the end goal.

3.6.4 Voice for Change (V4C) partnership—Policy advocacy and consumer perspectives

Ms Mary Njuguna, Voice for Change Partnership

Ms Njuguna said that the milk quality and safety seminar provided the evidence that allows all consumers to engage and change the narrative on food safety, particularly the on the cited health consequences. Voice for Change Partnership (V4CP) is a joint SNV-IFPRI CSO capacity strengthening project that supported by DGIS and implemented in Burkina Faso, Ghana, Honduras, Indonesia, Kenya, and Rwanda. The project stimulates multi-stakeholder collaboration in voicing development issues linked to food security and nutrition, resilience, renewable energy, and WASH.

In food safety the project is working with Consumer Unity Trust – a civil society that works to hold to account the respective dairy value chain actors to be responsible to ensure safe milk supply while at the same time represent consumer rights in this regard. She said the voice of consumers is important, because they are eventually the game changer, the Consumer demand for quality and safe milk would trigger respective supply chain actors to improve the quality of milk delivered in the market. V4CP has undertaken studies on milk quality through IFPRI and this has been the basis for CSOs engagement with policy makers. What is emerging is that whereas there are clear cases of negligence and ethical malpractices in the milk supply chain actors in dairy chain there is still a many producers who do not have requisite knowledge on milk safety practices as extension services does not reach them. Another key challenge is the fragmentation laws in food safety and overlap of mandates on food safety hence the drive by CSOs to advocate for the institutionalization of the Kenya Food and Drug Authority to consolidate action and drive food safety issues forward. Yet in another study by V4CP showed that budget allocation for food safety is minimal, and hence the need for consumers to lobby for more budgetary allocation to food safety processes in general by both county and national governments. Currently V4CP is active in Muranga, Nakuru, Laikipia and Nyandarua counties where the project is supporting the respective county governments to develop policies and strategies on food safety.

4 Objective 3: Opportunities and threats in driving a quality-based industry/sector

4.1 Opportunities

- Government support to the milk sector through creating an enabling environment by strengthening the policy framework that will ensure quality and safety measures are in place and provision of appropriate infrastructure: roads, chillers and coolers, milk testers, National Dairy Regulatory Laboratory
- Government support for the QBMPS and its upscaling
- Donor willingness to help in training, providing expertise in food safety (SNV Netherlands Development Organization, [SNV Kenya's Kenya Market-led Dairy Program](#), WUR)
- Extensive training of farmers in high milk-producing areas has already been carried out and will ensure a steady supply of milk for processing
- Adequate research on milk quality and safety to provide the evidence base for policy changes: [3R \(Robust, Reliable and Resilient\) Kenya](#), [Egerton University](#), [KIRDL](#), [IFPRI](#), [WUR](#)
- Research has provided evidence of the economic importance of milk quality and safety and the Ministry of Health may come in as an important partner
- Research has provided evidence of the importance of the sectorwide approach in food safety, human health and the environment
- Willingness of stakeholders to discuss and exchange knowledge and best practices in milk quality and safety through forums such as seminars/workshops
- Farmers willing to change to farming as a business and profession
- Good climate for dairy farming in many areas of Kenya, but vagaries of climate can cause fluctuations in milk production
- Good relations between county and national governments ensure legislation will be enforced and regulators' presence in counties will be felt
- County governments willing to strengthen agriculture and the livestock sectors because the two sectors provide livelihoods to communities and the counties derive revenue from the industry; and to embrace and upscale QBMPS
- Processors willingness to embrace and upscale QBMPS
- The cooperative movement is an institution in Kenya and can be used to train farmers and other stakeholders on food safety and quality including of milk, besides the regular services cooperatives provide
- Apex milk associations in Uganda and Kenya proactive in supporting and regulating the sector
- Standard operating systems for various processes already in place in pilot areas can be used as prototypes in other areas
- Availability of knowledge of use of technology in agriculture
- Consumers increasing awareness of food safety and quality issues including of milk and are demanding quality and safe products should catalyze changes in the production and processing of milk

- Demand for milk and milk products is income elastic. With growing middle class, a shift in consumption patterns is expected as long as quality and safety issues are addressed
- Presence of consumer groups that are willing to lobby for changes in food safety and quality at the highest levels
- Presence of large livestock herd provides potential to use scientific methods to improve milk production and make Kenya a net exporter of milk and value added products
- Best practices and experiences from other countries can be up-scaled in Kenya to reduce production costs and improve milk quality and safety, such as use of vaccination, use of fodder banks and good animal husbandry on the farm

4.2 Threats

- Behaviour change (knowledge, attitude, skills) takes time for people to change;
- Unwillingness to change by value chain actors who profit from unethical practices affecting milk safety and quality; some processors processes continue to leave the market with unsafe milk products; risk from milk outlets such as kiosks, supermarkets, ATMs, fail that fail adhere to strict hygienic milk handling and storing practices and so compromise the end product even when the other nodes have adhered to quality
- Effective law enforcement may take a while before regulatory agencies ensure compliance with milk quality and safety standards.
- Self-regulation may not be easy in the sector
- Farmers expectations may get too high and they start demanding higher bonuses.
- Farmers' individual circumstances may still force them to side-sell and therefore encourage the informal sector to flourish with their unhygienic practices – adulteration, use of plastic can, selling fresh raw milk
- Poor husbandry practices: Misuse if antibiotics and use of contaminated feeds will continue to affect livestock and human health and the environment
- The continuing high cost of production continues to make the dairy sector uncompetitive.
- Lack of a regulatory framework to addresses milk quality issues, adequate milk testing infrastructure, sufficient extension services and dispute resolution mechanisms.
- QBMPS is an expensive venture at the beginning, this can disillusion groups trying to upscale the practice, the difficulty of having a price neutral QBMPS in Kenya where penalties raised are used to pay for bonuses, and farmers switch to another milk buyer if penalized for poor milk quality
- Providing the necessary infrastructure such as laboratory, cold chain and testing kits for milk collection centres and rural cooperatives is expensive and may take time; poor infrastructure (roads and erratic power supply) remain challenges for farmers even when they are supplying good quality raw milk, and for transporters, resulting in underdeveloped raw milk collection systems
- An aging population of farmers, with farming in general still unattractive to the youth
- The long cash conversion cycle, high capital investment with low returns on investment may deter other players from entering the business
- Absence of comprehensive and reliable production data and impact assessment studies for each county that can help in planning to improve production

5 Objective 4: Next steps and potential for building a community of practice to champion the realization of safe and quality milk and dairy products

5.1 Harvesting ideas/issues from group presentations

Five groups addressed different topics guided by the following questions:

1. What is your vision in the next 5 years?
2. First actions to be taken?
3. Who wants to take responsibility?



Group discussions (Credit: Chams Media)

Table 2: Group discussions on opportunities and threats in driving a quality-based industry/sector

Vision	First actions to be taken	Who wants to take responsibility
Group 1: Building adequate laboratory capacity for testing milk quality		
Have laboratories at all levels of the value chain starting from the dairy cooperatives all through to the National Reference Laboratory, and harmonize ways of testing	Make an inventory of the laboratories available in Kenya today both in the private and public sector	Kenya Dairy Board to take the lead and have the support of other laboratories
Group 2: Improving dairy farming practices and milk handling		
Safe and quality milk and milk products for all consumers	Form farmer groups or dairy cooperatives and federations for easier: Capacity building and training Incentives and regulation of dairy farmers for improved milk quality Inspections of dairy farms Consumer awareness on milk safety and quality issues Feeds and fodder – production, screening, costing Animal health and hygiene issues Record keeping	All dairy value chain stakeholders— Dairy farmers Dairy cooperatives Milk processors County governments National government

Group 3: Scaling QBMPS implementation County by County		
All milk processors know the value of milk quality and are aware and willing to implement QBMPS	(At challenging points): Are the needed facilities available? How quickly do we get results - aflatoxins and antibiotics are key Capacity building among processors since all are not equipped KDB lab could be a service provider to validate tests KDPA to lobby its members on QBMPS Extension is key – how do counties partner with milk processors to support extension; cooperatives should also have training and extension for its members; Incentives catered for	Milk processors Dairy cooperatives Milk transporters County governments KDB
Group 4: Raising awareness among consumers		
Consumers to demand safe and quality milk after being well informed	National Consumer Protection Authority needs to be seen more in action Raise awareness on consumer rights KDB to sensitize consumers more on the quality of milk and milk products being consumed Dairy sector to shift more from informal to formal status Innovations to ensure prices are maintained low even after QBMPS Random tests to be shown to the consumers publicly Have pull outs and leaflets in the local dairies on consumer issues Consumers will be informed of the processors who are investing in quality Strong consumer bodies and quality champions	Consumer awareness authorities Consumer protection authorities KDB KDPA
Group 5: Community of practice to ease collaboration /learning in the sector		
Have a community of practice in place for better collaboration in the sector	Bench marking with developed economies or areas where collaboration has worked	All stakeholders in the dairy value chain

6 Closing remarks

Dr. Immaculate Maina, CEC, Agriculture, Livestock and Fisheries for Nakuru County and Mr. Anton Jansen (KMDP lead) made closing remarks that summarized the meeting with the following policy actions.

On the QBMPS

- Milk processors should embrace QBMPS to improve the quality of raw milk being received. Milk quality parameters for bonus payment under the QBMPS will vary.
- Stakeholders in the dairy sector can learn from the different pilots on what works and what doesn't for the successful implementation of the system.
- QBMPS makes the dairy sector more competitive; this could start with testing fewer quality and safety parameters to maintain loyalty of milk suppliers, then increasing number the parameters along the way.
- Brookside will begin to implement a QBMPS and KDPA is working on their strategic plans which incorporates milk quality and safety assurance and this is progress in ensuring milk quality and safety.
- The QBMPS having received attention is a step forward in quality and safety assurance.

For consumers

- Information on milk safety and quality should be provided to consumers so that they can change behavior and demand for safe and quality milk and milk products and improve hygiene in the households.

For regulators

- Work together to eliminate bad and unethical practices in the sector.
- Penalize non-compliance to make it painful for offenders. It is impossible to regulate ethics but penalties can help to eliminate bad practices.
- Develop standard operating procedures for all the actors across the value chain.
- Devolved laboratory system to the counties

Sector coordination

More coordination is needed in the sector; public health should be proactive rather than reactive when there is a food safety and quality problem. The State Departments for Agriculture, Health and Environment should work using the sector-wide approach as food safety and quality cuts across these ministries.

For academia and researchers — generating new knowledge

- Carry out county-specific research and analyses that will generate county-specific data to guide the county governments.
- Continue generating critical data to guide the dairy industry. Create a central one-stop repository to data to guide decision making, lobbying and advocacy.
- Carry out county-specific value chain analyses because milk quality and safety-related issues affect counties differently.

- Carry out more epidemiological studies and consolidate data; a direct link has been established between consuming milk and milk products, human health and the environment.

For national governments

- The long cash conversion cycle, high capital investment with low returns on investment, and a disconnect between quality and pricing, the high cost of individual milk testing make milk business an expensive task. The government should find ways to make processing more sustainable and feasible to maintain the business, and also make the business attractive to the youth.
- Move from procuring ordinary farm milk coolers to the more effective instant milk chillers.
- Develop, finalize and enact the necessary policies to assure the population consumes safe and quality milk and milk products
- Zero-rate inputs (feeds, milk cans and equipment) to lower their cost
- Consolidate and harmonize the various livestock policies for better implementation.
- End the silo planning approach; the Health, Environment, Agriculture and the Water departments should plan together in the county and at national level going forward for better impact in addressing safety and quality issues.
- Operationalize the national milk reference laboratory for quality checks.
- Review processes and practices of all players in the value chain (producers, processors, machinery, infrastructure, hygiene products in the system, packaging).



Dr Immaculate Maina, CEC, Agriculture, Livestock and Fisheries, makes the closing remarks (Credit: Chams Media)

For County governments

- Install instant milk coolers/plate heat exchangers to enhance the cooling effectiveness of the milk coolers in place.
- Enforce regulations and standards, support training and extension, construct and equip laboratories, and work with all stakeholders to improve milk quality.
- Use sector-wide planning for synergy and better impact.

For the media

- Inform and educate the public about milk quality and safety issues.

For processors

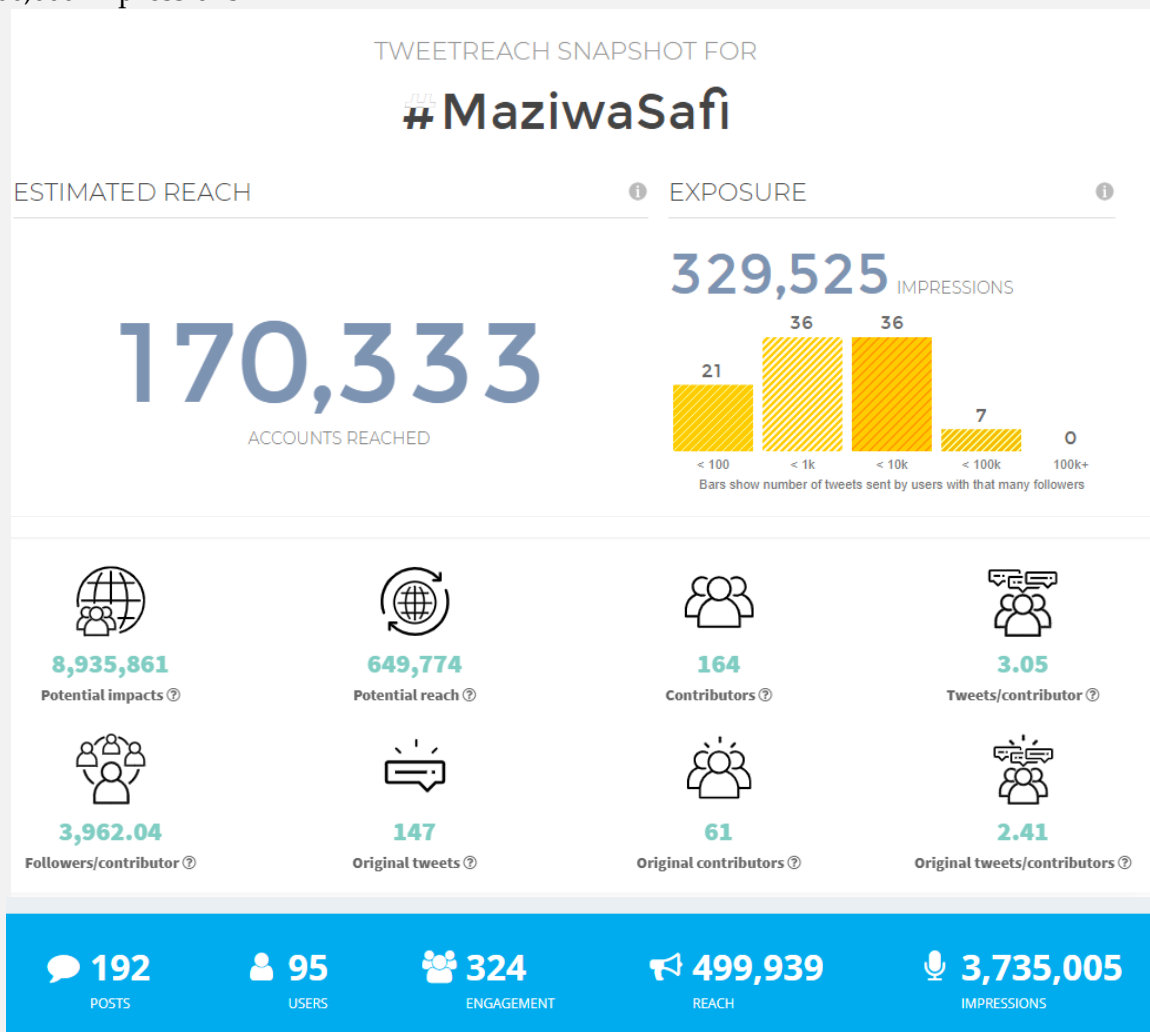
- Enhance your capacities to match international standards by bringing in new technology and best practices.
- Take the responsibility to sustain a vibrant dairy industry by providing safe and quality milk and milk products.

Media coverage

Background information of the seminar proceedings including key speeches as well as interviews with key stakeholders by media houses were captured on news articles (print), radio stations and TV stations:

- Business Daily ([Print](#))
- Standard Newspaper ([Print](#))
- Seeds of Gold Pull Out – Nation ([Print](#))
- The Star (Print)
- People Daily ([Print](#))
- Citizen, Hot96 FM and all RMS Vernacular Stations
- KTN/CHAMS Media ([TV](#))
- KTN News ([TV](#))
- Citizen ([TV](#))
- KBC ([TV](#))
- NTV ([TV](#))

A social media campaign was also done under the hashtag #MaziwaSafi which trended on twitter the entire afternoon, reaching more that 170,000 twitter accounts, with more than 300,000 impressions



Appendix 1 Participant List

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Appendix 2 Agenda

Time		Agenda item	Facilitator (s)
8.30 – 9.00am		REGISTRATION	
9.00 – 9.05am		Welcome and Introductions	Philip Cherono (KDB) & Catherine Kilelu (ACTS)
9.05 – 10.00am	Opening addresses	<ul style="list-style-type: none"> a) Kenya Dairy Processors Association representative – Milk quality and safety as a key pillar of sector strategy b) Albert Mwaniki, CEC Agriculture, Murang’a County c) Margaret Kibogy, MD KDB – Enhancing traceability and compliance in the Kenyan Dairy sector d) Sanne Willems, First Officer, Food Security and Water, Embassy of the Kingdom of the Netherlands (EKN) e) Harry Kimtai, PS Livestock – Keynote Speech 	
10.00 – 10.15am		COFFEE/TEA BREAK	
10.15 – 10.30am		Martin de Jong, Bles Dairies Consultancy – Introduction on QBMPs – Overview of principles and practices	Judy Kithinji (SNV) & Emmanuel Kabaki (Brookside)
10.30 – 11.20am	Case studies	<ul style="list-style-type: none"> a) Happy Cow’s experience on piloting a QBMPs in a complex smallholder supply chain – Gerard Oosterwijk & Teresia Ndungu b) Evidence and lessons from the Happy Cow QBMPs pilot – Who benefits and successes and challenges – Asaah Ndambi & Catherine Kilelu Q & A	
11.20 – 11.55am		<ul style="list-style-type: none"> a) Bio-Foods Ltd’s QBMPs approach – What are the lessons? – Jasper van den Brink b) Lessons from Uganda on QBMPs – The TIDE pilot project, Uganda – Andrew Sekitoleko, SNV Q & A	
11.55 – 12.20pm		<ul style="list-style-type: none"> a) The Danish Strategic Sector Cooperation (SSC) programme on food safety – the Kenyan dairy sector’ – Henning Nygaard – Growth Counsellor Food, Danish Embassy b) Reflections from Nyandarua County on improving milk quality and safety: The milk hub experience – James Karitu, CEC Agriculture, Nyandarua County Q & A	
12.20 – 1.00pm		Identifying Lessons Learnt in operationalizing milk quality assurance – Enabling and Disabling factors – Group discussions	Mary Njuguna (SNV) & Annabelle Daburon (WUR)
1.00 – 2.00pm		LUNCH BREAK	
2.00 – 2.15 pm	Policy, Research & Advocacy	The Multi-Annual National Control Plan – Reflections from the National Food Safety Coordination Committee – Director of Public Health – Robert Kilonzo	Paul Ndungu (KDB) & Asaah Ndambi (WUR)
2.15 – 2.50pm		Panel presentation – Insights from research on milk quality and safety – evidence and potential solutions – BO Bebe, George Wanjala and Vivian Hoffman Q & A	

2.50 – 3.05pm		Voice for Change Partnership – Policy advocacy and consumer perspectives – Mary Njuguna & Daniel Asher Q & A	
3.05 – 3.50pm	Group work & plenary	Threats and Opportunities for a Quality-based Industry – Towards solutions (Group sessions)	Discussions & presentations Jan van der Lee & Annabelle Daburon (WUR)
3.50 – 3.55pm		COFFEE BREAK	
3.55 – 4.30pm		Harvesting ideas/issues from group sessions – Group presentations	
4.30 – 5.00pm		Wrap up session – Summary of lessons learnt and commitment to action	
5.00pm		CLOSING REMARKS KDPA/KDB/CEC	Anton Jansen (SNV)
		<i>Drinks & Bites</i>	

Appendix 3 Keynote Speech by the Principle Secretary, State Dept. of Livestock

SPEECH BY THE PRINCIPAL SECRETARY, MR. HARRY KIMTAI, STATE DEPARTMENT OF LIVESTOCK

MILK QUALITY AND SAFETY SEMINAR

THEME: FOSTERING SAFE MILK PRACTICES FOR A COMPETITIVE KENYAN DAIRY SECTOR

VENUE: AZURE HOTEL, WESTLANDS, NAIROBI

DATE: 29TH JANUARY 2019

Representative of the Embassy of Netherlands,

Managing Director, Kenya Dairy Board

Stakeholders in the dairy value chain,

Ladies and Gentlemen;

Good morning. I am honored to be with you this morning to open this important seminar on milk quality and safety. The coming together of stakeholders to discuss and reflect on common and important issues is important in the development of the dairy value chain. I therefore wish to thank Kenya Dairy Board, SNV Kenya and the 3R project for organizing this seminar which focuses on fostering safe milk practices for a competitive Kenyan dairy industry.

The livestock industry has traditionally been an important socio-economic activity in most of the Kenyan communities. Rearing of cattle, camels, goats and sheep among others has been a major source of sustenance, livelihoods and social security for many generations. Introduction of exotic dairy cattle in the early 1900s set the stage for commercialization of milk production, processing and marketing of dairy produce. Over time, the dairy industry through various stakeholders, has made considerable investments to develop a supportive and conducive environment including policy, regulatory and institutional framework and infrastructure for milk production, bulking and cooling, processing and marketing.

Ladies and Gentlemen;

Milk production in Kenya from cattle, camels, goat and sheep is estimated at 5.2 billion litres per year. The cattle milk value chain is the most developed and commercialized with an annual production of approximately 4.1 billion litres. This is produced by an estimated 1.8 million smallholder dairy farmers and a few middle and large scale farms who partly market their produce through a network of over 500 dairy farmer groups spread out in various parts of the country. On processing, approximately 650 million litres are processed per year. While this volume has been growing over the last decade, it is

nevertheless important to note that there is an estimated 60% under-utilization of the installed capacity. Producer prices offered by raw milk processors, in comparison to the informal sector, have often been cited as a contributing factor to this scenario. Overall, the dairy industry impacts on the national economy by contributing approximately 44%, 12% and 4% of the livestock, agricultural and national Gross Domestic Products respectively.

Ladies and Gentlemen;

Milk quality and safety are important attributes in the dairy value chain as they affect milk processing, marketing and consumption. Prior to liberalization in 1992, the Kenyan dairy industry was highly organized and formal. Raw milk was bulked through groups and delivered to the then Kenya Cooperatives Creameries for processing and marketing. There was observance of good hygienic standards across the value chain right from production to marketing. The use of food grade containers such as aluminum and stainless steel cans in transportation and handling of raw milk was the rule rather than the exception. However, after 1992, there was a collapse of the well-structured formal collection, processing and marketing infrastructure for milk and milk products and the proliferation of informal milk marketing. These has continued to affect the compliance of the dairy industry and its products to milk quality and safety requirements as the existing standards for milk production and handling are compromised. To date, the industry is still facing several challenges on the quality and safety of milk and milk products primarily due to poor dairying practices. This has been complicated by the declining and inadequate farmer extension and advisory services and of course unethical practices by some scrupulous milk dealers and service providers which impact on the quality and safety of milk and milk products with a potential for compromising consumer safety and competitiveness of our products.

Ladies and Gentlemen;

The Kenyan constitution protects the rights of Kenyans to access adequate food of sufficient quality. The dairy value chain in Kenya has therefore to rise up to the challenge of increasing production and productivity of quality and safe milk and milk products to meet growing demands from consumers. Many dairy industries worldwide have instituted Quality Based Milk Payment Systems to provide incentives to milk producers to improve milk quality and safety. The current milk payment system in Kenya is based on quantity and not quality. This is a simple and easily understood method to calculate the price of milk. However, it does not provide incentives to milk producers to improve quality and safety of milk. It also does not discourage malpractices such as adulteration and non-adherence to withdrawal periods for veterinary drugs used in treatment of lactating animals.

Ladies and Gentlemen;

I am encouraged that the concept of implementing Quality Based Milk Payment Systems are beginning to take root in Kenya. Despite the small number of processors who have embraced this option, such as Bio Foods and Happy Cow, I am hopeful that the other processors will also embrace this direction in the near future. Focusing and motivating farmers to produce quality and safe raw milk has huge potential to transform this industry by improving productivity, value addition and market access.

Ladies and Gentlemen;

The dairy industry will continue to play a pivotal role in the delivery of the 'Big Four Agenda' especially the pillars on Manufacturing and Food and Nutritional Security. Among the deliverables in this industry is to increase the volume of processed milk by 100 million litres per year, with an overall objective of reaching 1 billion litres by the year 2022. This will go hand in hand with improving compliance of the dairy industry and its products to milk quality and safety requirements at a rate of 5% per annum.

The Government has continued to support the development and compliance of the dairy industry and its products to milk quality and safety requirements. In order to comprehensively address food safety and promote domestic and international trade, the Government is planning to establish an authority that will have overall responsibility over the safety of food and drugs in the country. The mechanisms for the establishment of the proposed body, the Kenya Food and Drug Authority, are underway. The regulatory framework in the dairy industry is also being addressed through the draft Dairy Regulations that seek to enhance organization and compliance of milk dealers across the dairy value chain. To promote organized marketing and quality of raw milk, the Government has procured and distributed over 300 milk coolers to dairy farmer groups through the County governments. An additional 600 milk coolers will also be distributed in the next few years to improve proximity of cooling facilities to dairy farmers. Raw milk should ideally be cooled within two hours of milking and therefore expanding the infrastructure for raw milk cooling is an important step in improving the microbiological quality of raw milk. The Government is also supporting the Kenya Dairy Board to establish a National Dairy Regulatory Laboratory for the purpose of promoting surveillance on the quality and safety of dairy products. This will complement compliance, consumer protection and promote trade in quality and safe dairy products. On standardization, the Government has developed an elaborate framework of dairy standards that cover all the major dairy products manufactured or traded locally. These standards cover safety requirements as informed and benchmarked on international standards such as those developed by the Codex Alimentarius Commission.

Ladies and Gentlemen;

As I conclude, I wish to request the stakeholders in the dairy industry to seriously consider investing in Quality Based Milk Payment Systems and other schemes that will motivate dairy farmers to increase production of quality and safe raw milk. Promoting self-regulation within the industry is also a key component in improving compliance in the dairy value chain. To this end, the players in the industry should embrace organization and cooperation amongst themselves with a view to promoting self-regulation and compliance to standards. The challenge now is to sensitize all the stakeholders on these requirements and enforce compliance.

I now wish to declare this seminar officially open and to wish you a fruitful and productive deliberations.

Thank you and God bless you

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Workshop Report 002
ISSN 0000-0000



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