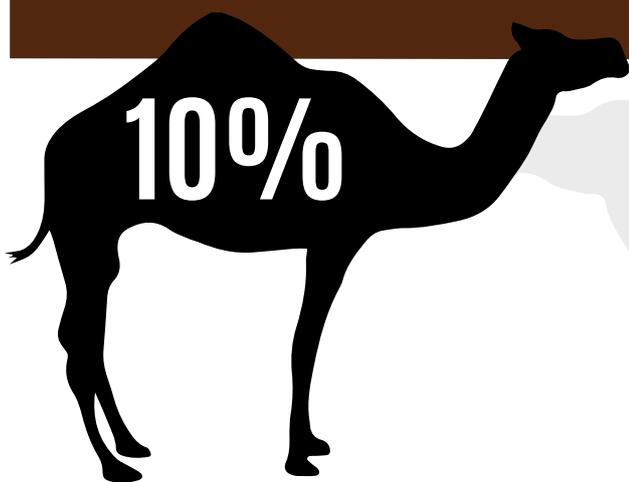


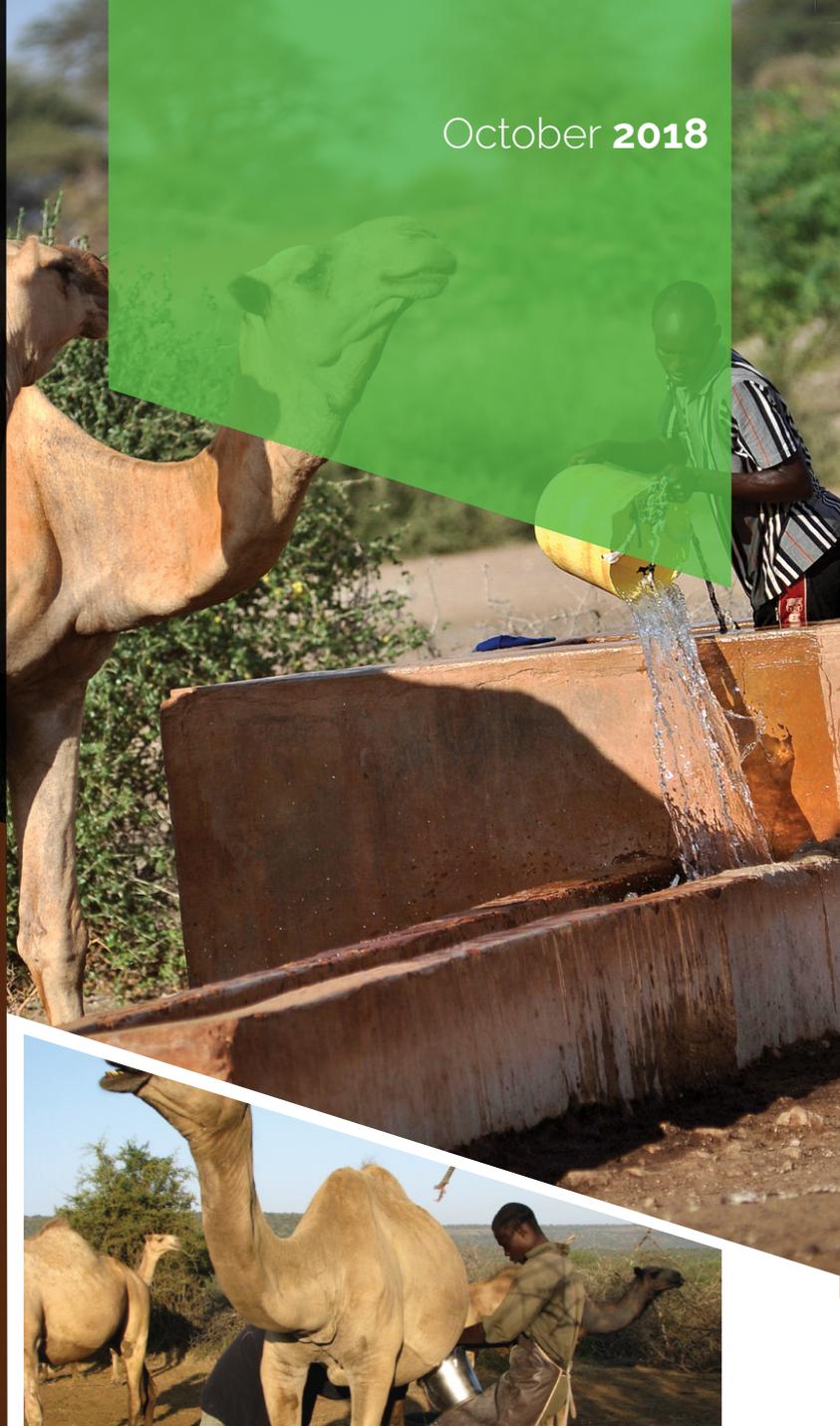
October 2018

POLICY BRIEF

IMPROVING CAMEL MILK QUALITY AND SAFETY FOR HIGHER INCOMES FOR PASTORALISTS



Camel milk contributes 10% of all milk produced in Kenya



- Milk contributes close to KES 258 billion annually in Kenya of which camel milk contributes 10%. Camel milk economy is equivalent to the GDP of coffee or cotton and pyrethrum put together
- Camel milk contributes half the diet of pastoralists during droughts, making its impact even greater in drylands since it is still available when goat, sheep and cattle are no longer producing milk during droughts
- Camel milk is a therapeutic product preferred by many due to its medicinal value against diabetes, tuberculosis, and ulcers among other diseases.

Camel milk industry needs to embrace processing and value addition of products to bring transformation from subsistence farming to a competitive, commercial and sustainable dairy industry for economic growth and wealth creation, in line with vision 2030 and big four initiative.

What is the issue?

Camel milk production, handling and safety remain unregulated. The milk is usually sold unprocessed or without value addition through informal milk chains. These significantly contribute to poor incomes for pastoralists due to milk losses, resulting from spoilage and low market prices caused

by the negative image of camel milk caused by current handling practices. Selling technologically unprocessed milk is of concern, as this is related to perceived health risk. Moreover, camel milk transported with plastic jerry cans on many occasions gets spoilt and is sold as sour milk which fetches lower prices.

Why camel milk and the camel

Kenya's arid and semi-arid lands (ASALs) account for 88% of the total land (Ogotu et al. 2016), suggesting its economic importance for the country. This area supports about 36% of the population (REGLAP Secretariat, 2012), 80% of the livestock and 65% of the wildlife (Njoka et al. 2016). The ASALs are low rainfall zones which receive 200–750 mm of rainfall annually which weaken the resilience of pastoralists rendering them food insecure (REGLAP Secretariat, 2012). In these regions pastoralists have adopted camels as drought-tolerant species, supporting their livelihoods and source of income.

The country's camel population was about 3.22 million in 2016 (FAOSTAT, 2018), with annual camel milk production of 940 million litres in 2013. Kenya has the fourth largest camel population in the world (FAOSTAT, 2018). Even though camels, offer the most efficient means of exploiting the resources in the ASAL areas, there is an inadequate investment in the sector in comparison to other livestock species (Elhadi et al., 2015).

Reasons for low quality and safety in camel milk at final markets

Milk is sold in small recycled plastic containers of 0.5–5 liters and 20 liters after pooling. This leads to the huge losses in the sector.

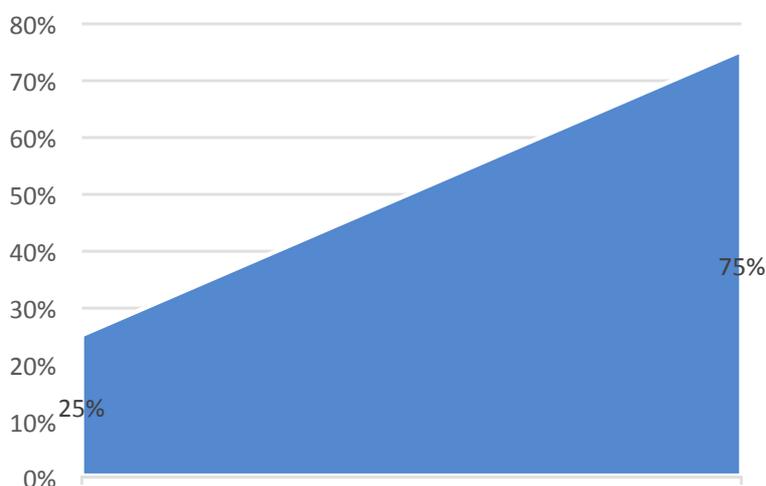
Unknown to many people, using plastic containers is a major cause of high post-harvest losses and health risks. This is because the containers are difficult to clean and easily scratched, allowing areas where spoilage and pathogenic microorganisms can multiply. Microbial growth is greatest in the hot areas, especially where the milk is produced.

In addition, some of the surfaces of the containers are unreachable during cleaning, especially the

hollow handles and the corners, making the milk less fresh. Current traditional cleaning practices, including container smoking, are ineffective since the containers showed 25% of milk at the Isiolo market was not acceptable while 75% of fresh milk was not acceptable at the final market in Nairobi (Kaindi et al. 2011).

Other underlying causes are low investment in adequate milk cooling systems and lack of infrastructure for value addition and processing of milk.

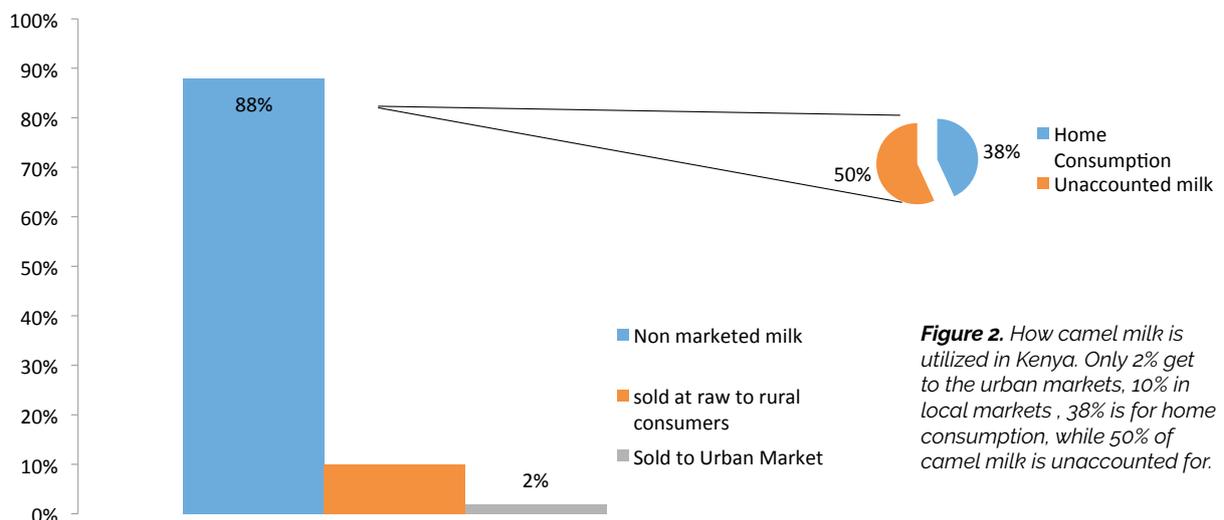
Proportion of milk that is unacceptable



Challenges of camel milk

Milk in primary collectors (Isiolo)

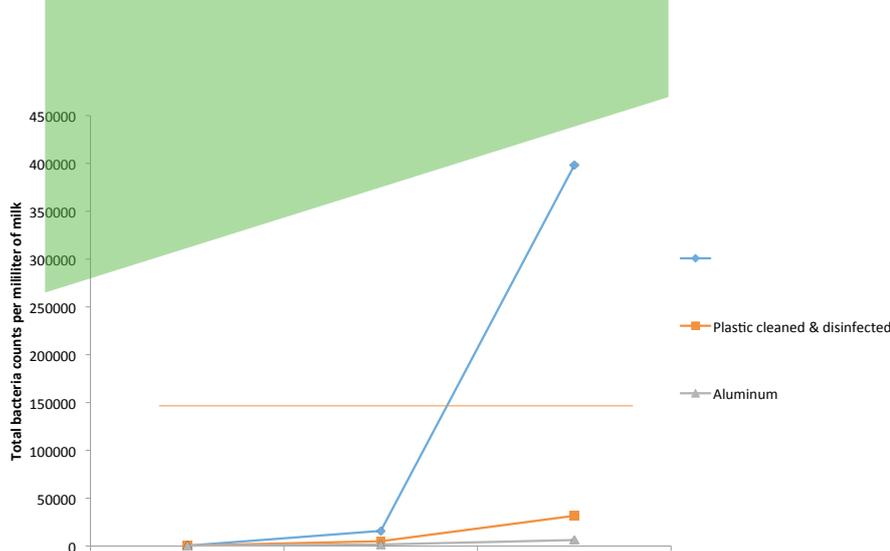
Milk in Final Market in Nairobi



Strategies to solve camel milk quality and safety challenges

Informal milk traders have refused to use the more durable and easy to clean aluminium containers since they believe the plastics are cheap and easily transportable. The final milk quality when aluminium is impressive (Figure 3), shown by the low microbial counts compared to plastic jerry cans (Kaindi 2010). Milk transported in plastic containers spoils faster and the microorganisms increase up to an unacceptable level within 5 to 6 hours before the milk reaches the final market in Nairobi. Using clean water, with soap or detergent and a disinfectant improves the cleanliness of plastic containers. In addition, containers with large opening facilitate cleaning (Bonfoh et al. 2006). To see the transformation in the sector, a whole chain approach is needed and education of all actors on hygiene handling of milk and storage. If individual farmers and vendors come together and form cooperative groups, the challenges will be effectively addressed due to the interconnected nature of

actors in the value chain. The actors will need to build a common vision, strategy and act together for the development of the sector to achieve increased growth and competitiveness. Groups will have ease in accessing financial support for interventions and increase the economies of scale especially in purchasing of seamless aluminium containers, and installation of bulk cooling plants. With cooperatives, farmers will be able to collectively invest in a cooling and heat treatment system and this will enhance the capacity of farmers and vendors to deliver on quality and safe products for their consumers. When farmers are organized in groups, it will be easier to organize for capacity building activities such training on milk hygiene and safety, access to clean water, the establishment of quality control laboratories, purchase of a vehicle or other means of transportation of their products to the markets.



The cost of non-action

Form Farmer and vendor cooperative groups for ease of milk marketing and interventions. If action is not taken, farmers will continue to lose 1.73 billion shillings every year. Consumers will also remain at great risk from consuming products that are untested for safety and quality.

Policy recommendations

County Governments

- Give a stimulus package to farmer groups to spur investment for cold chains, small/medium processing plants and trucks for transportation, and purchase of seamless aluminium containers
- Develop legislation for camel milk handling and safety

Kenya Camel Association

- Sensitize and enforce members to form farmer and vendor cooperative groups for ease of milk marketing and interventions

Camel milk farmer groups, vendors and processors

- Form farmer and vendor cooperative groups for ease of milk marketing and interventions
- Use containers with large opening because they allow for effective cleaning
- Use stainless steel containers to keep milk safe and of high quality
- Allow for continuous education of farmers, and to practically involve farmers in milk hygiene experiments, for, "Seeing is believing".

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Reference

1. Bonfob B, Roth C, Traoré AN, Fané A, Simbé CF, Alfaroukh IO, Nicolet J, Farah Z, Zinsstag J (2006) Effect of washing and disinfecting containers on the microbiological quality of fresh milk sold in Bamako (Mali). Food Control. Vol.17 (2), 153-161.
2. Elhadi YA, Nyariki DM, and Wasonga OV (2015). Role of camel milk in pastoral livelihoods in Kenya: contribution to household diet and income. Pastoralism 5, 8.
3. FAOSTAT (2018), <http://fenix.fao.org/faostat/internal/en/#data/QA> accessed on July 18, 2018
4. Kaindi DWM, (2010). Effect of using aluminium containers vis a vis recycled plastic containers and the impact of improved sanitizing practices during handling and marketing of camel milk in Kenya. Poster. International Camel Conference, Kenya June 2010.
5. Kaindi DWM, Schelling E, Wangoh J, Imungi JK, Farah Z, and Meile L (2011). Microbiological Quality of raw milk across the Kenyan Market chain. Global Science Books (Food 5) Special issue 1, 79-83.
6. Musinga M, Kimenyi D and Kivolonzi P (2008). The camel milk industry in Kenya. Results of a study commissioned by SNV to explore the potential of camel milk from Isiolo District to access sustainable formal markets. SNV world, The Hage, Netherlands: Nairobi, Kenya. http://www.snvworld.org/en/download/publications/camel_milk_industry_in_kenya.pdf.
7. Njoka J, Yanda P, Maganga F, Liwenga E, Kateka A, Henku A, mabhuye E, Malik N, and Bavo C (2016). Kenya: Country assessment. Working paper. University of Nairobi, The Centre for Sustainable Dryland Ecosystems and societies (CSDSES) and Pathways to resilience in Semi-Arid economies (PRISE). http://prise.odi.org/wp-content/uploads/2016/01/Low-Res_Kenya-CSA.pdf
8. Office of President (2018). The government of Kenya – Office of President. The Big 4 agenda. 100% food and nutrition security commitment. <http://www.president.go.ke/food-security-and-nutrition/> Date accessed on August 01, 2018.
9. Ogutu JO, Piepho H-P, Said MY, Ojwang GO, Njino LW, Kifugo SC, et al. (2016) Extreme Wildlife Declines and Concurrent Increase in Livestock Numbers in Kenya: What Are the Causes? PLoS ONE 11(9): e0163249. <https://doi.org/10.1371/journal.pone.0163249>
10. REGLAP secretariat (2012). Key statistics on the drylands of Kenya, Uganda and Ethiopia. https://reliefweb.int/sites/reliefweb.int/files/resources/Annex+1+Key+Statistics+on+drylands+of+the+Horn+of+Africa_+October_+2012.pdf

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