Improving Milk Quality in Smallholder Dairy Systems: Towards Realising Food Safety and Food Security in Kenya

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Abstract

Smallholder dairy value chains provide high quality protein for consumers, and income and employment for farmers and dairy value chain actors in Kenya. Milk quality in the informal value chain, the primary market channel in Kenya is variable, often does not meet standards, undermines food security and food safety, and constitutes a constraint to long-term sustainability of the sector. An improvement in milk quality would enable Kenya to move towards realising sustainable food security as envisioned by the United Nations sustainable development goal 2. To achieve improved milk quality, there is need to focus on prevention of hazards (chemical, physical and microbial contaminants) notably, through implementation of existing but unenforced quality assurance systems in the value chain.

This study was carried out in Nakuru, Nyandarua and Laikipia counties in Kenya using a mixed methods approach. A spatial framework for market quality guided the study and considered urban and peri-urban locations (PUL), mid-rural locations (MRL) and extreme rural locations (ERL). A questionnaire was administered to 652 smallholder farmers to elicit information on farm practices and knowledge relating to milk quality. 432 milk samples were collected in the formal and informal value chains. Analyses for composition, microbial contamination were undertaken. Observations were made across the value chains. Finally, key informant interviews were held to triangulate information.

Findings revealed high microbial contamination in all three counties (*E. coli* 35.2 %, *Pseudomonas spp.* 53.4, *Staphylococcus spp.* 2.5 % and 2.3 % positive for milk ring test (MRT). Microbial contamination was higher in MRL and PUL than in ERL. Composition revealed mean butterfat 3.58 %, protein 3.53 % and solid not-fat 9.190 %. Protein content was below average except in Nyandarua and in MRL when results were analysed according to the spatial framework and counties. Economic incentives encouraging farmers to improve milk quality were lacking. There was low knowledge of milk quality especially of the importance of milk composition across all counties. Institutional capacity (under-staffing and lack of resources) constrained the implementation and enforcement of milk quality control systems. Observations revealed the use of non-food grade plastic containers and poor handling of milk by actors across the value chain.

Keywords: Dairy value chains, food safety, food security, milk quality, SDGs

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