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Hygiene practices and safety of milk supplied by smallholder farmers in agroecological zones in Kenya

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Abstract

Smallholder farmers dominate the Kenyan dairy sector producing 95 % of the total milk. These smallholder dairy farmers employ agroecological farming depending on the various climatic zones in which they are located. However, several concerns have been raised on the quality and safety of the milk they produce. This study assessed the hygienic practices and microbial safety of milk supplied by smallholder farmers to processors in three agroecological zones: Highlands, Upper Highlands, and Lower Highlands in Kenya. Interviews and direct observations were carried out to assess hygiene and handling practices by farmers and a total of 92 milk samples were collected along four collection channels: direct suppliers, traders, cooperatives with coolers and cooperatives without coolers. Microbial analysis was done following standard procedures and data analysed using GenStat and SPSS. This study revealed that farmers did not employ good hygienic practices in their routine dairy management. They used plastic containers for milking and milk storage (34.2 %); they did not clean sheds (47.9 %) and did not set aside cows that suffered from mastitis (83.6 %), resulting in poor microbial quality of raw milk along the collection channels. The study showed that microbial contamination began at the production level and increased during handling at the cooperatives and during transportation in the hot tropical temperatures without cooling. The highest mean total viable counts (8.72 log₁₀ cfu ml⁻¹) were recorded in the highlands while the upper highlands had the highest mean *E. coli* counts (4.97 log₁₀ cfu ml⁻¹) and the lower highlands recorded the highest mean counts of 5.13 and 5.78 log₁₀ cfu ml⁻¹ for *Staphylococcus aureus* and *Listeria monocytogenes* respectively. Based on all above-mentioned parameters, the microbial load in most samples from all three agroecological zones exceeded the set Kenyan standards. Farmer training, improving road infrastructure, use of instant coolers at cooperatives, and quality-based payment systems are recommended as measures to curb microbial growth and improve quality of milk to avoid wastage through contamination.

Keywords: Agroecological zones, dairy farmers, hygiene, Kenya