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Assessment of camel milk handling practices and bacterial loads along the value chain in Borana and East Shewa, Ethiopia

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Abstract

Camel milk plays a vital role in the livelihood and food security of pastoral and agro-pastoral communities in Ethiopia, especially in Borana and East Shewa zones. However, poor milk handling practice compromises the quality and safety of milk along the value chain. A cross sectional study was conducted to investigate hygienic milking, milk handling practices and microbial quality along the value chain in Borana and East Shewa. Milk handling practices were assessed through semi-structured interviews and through observation involving 48 camel milk producers, 20 collectors, 10 retailers, 10 cafeterias, 4 cooperatives, 20 consumers and 12 experts. A total of 752 milk, hand swab and container swab samples were collected from both zones during the wet and dry seasons, and subjected to aerobic plate and coliform count. Results showed that while most producers never washed their hands (73 %) or cleaned the udder (95.8 %) before milking, post-milking hand washing was common (91 %). In contrast, vessel hygiene practices were considerably better as nearly all producers washed (97.9 %) and smoked (95.8 %) their milk containers daily. All of the retailers (100 %) and 60 % of the collectors washed their hands with water and soap while handling milk. Nearly all of the value chain actors keep milk at room temperature until consumption. Regarding the awareness of food safety risks along the milk value chain, experts demonstrated the highest awareness of zoonotic diseases (83.3 %), whereas boiling of milk especially for vulnerable population groups is not a common practice, particularly among producers and consumers. In both zones and seasons, the mean aerobic plate (7.47 log CFU/ml) and coliform (7.13 log CFU/ml) counts surpassed the EU standard for raw milk other species. Bacterial contamination peaks at the retailer level, whereas relatively lower values recorded at the cafeterias and cooperative level. The overall mean aerobic plate counts slightly increased in the wet season as compared to the dry season, while coliform counts slightly decreased in the wet season. Given the prevailing poor hygiene and limited food safety awareness, milk is exposed to contamination risks that require interventions in training and handling practices to enhance food safety.

Keywords: Camel Milk, Ethiopia, Microbial quality, Milk Handling, Milk Hygiene, Value Chain