

ABSTRACT

Hygiene practices from milk production to processing are significant on the quality of milk and milk products. In Malawi, hygiene practices in small and medium enterprises (SME) milk processing plants and their influence on development of biofilm and subsequent microbial safety of milk had little attention. A cross-section study design was used where a survey on hygiene practices of handling raw cow milk from the farm to the bulking centre in Lilongwe district was carried out to assess the influence on biofilm formation in the handling equipment. A Semi-structured questionnaire was administered to 256 respondents. A complete randomized design (CRD) was used to sample 90 samples (30 each of milk, water and swabs) from farmers' households and at bulking centres clustered in six bulking groups. The samples were analysed for total viable count (TVC), coliform counts (CC), Lactic acid Bacteria (LAB) and Yeasts and Moulds. Biofilm indicator isolates of *Pseudomonas*, *Bacillus*, and *Salmonella*, which were isolated from the samples were tested for biofilm forming capacity using tube method. Results indicate that up to 100% of the dairy farmers from the six milk bulking group sourced water from boreholes and up to 80% use without treating. Plastic containers were the major handling (up to 66.7%) and storage containers (up to 91.7%). Evening milk was stored at a room temperature overnight (up to 100%) and mixed with morning milk to be taken to bulking centres. The mean TVC was 7.57 ± 0.45 log₁₀ cfu/ml, CC was 6.06 ± 0.36 log₁₀ cfu/ml, Y/M was 5.33 ± 0.38 log₁₀ cfu/ml and LAB was 5.73 ± 0.36 log₁₀ cfu/ml in all the 30 milk samples taken. Gram negative rods were the dominant group of bacteria accounting for 85.9% at the farm as compared to bulking centres which was 70.6%. The Gram-positive cocci and rods were less than 14.1% and 14.1% respectively at farm level while at the bulking centres they were 5.9% and 52.9%. Biofilm indicator microorganisms *Salmonella*, *Pseudomonas* and *Bacillus* were detected at farm level at 20%, 12% and 10.7% respectively while at bulking centres they were *Salmonella* (15.8%) and *Bacillus* (42.1%). The swab had the highest biofilm indicator microorganisms (17.5%). Using the tube method, 17.95% of the isolates formed strong biofilms and 43.59% formed moderate biofilm. Farmers and workers at bulking centres need knowledge on proper hygiene practices and sanitation in handling milk for further processing by large scale processors to produce quality and safe milk products