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Effect of farm management practices on the welfare of dairy cows and microbiological quality of raw milk in Naththandiya area, Sri Lanka

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Animal welfare receives great attention as it is highly important for enhancing milk production and microbiological quality. Literature reveals that the apprehension of dairy cow welfare practices among farmers is at a low level and limited studies have been carried out on dairy cattle welfare, in Sri Lanka. This study focused on investigating the impact of cattle management and welfare practices on the microbiological quality of raw milk. A total of 87 dairy cows from 50 tie-stall dairy farms in the Naththandiya Area in Sri Lanka were randomly selected. Three categories of measurements were collected; protocol-based measurements, facility-based measurements and animal-based measurements based on a questionnaire. The microbiological quality of raw milk samples was determined using Total Colony Count (TCC) of bacteria and count of *Bacillus cereus*. Statistical analyses of data were performed using SPSS 23.0 software. The floor quality was assessed in terms of cleanliness, presence of hoof damageable cracks and the grip. It was found that farmers' attention on quality of flooring remained low. Improper flooring conditions, including presence of dirt (28%), slippage (62%), and hooves being prone to damage (50%), were observed and correlated ($P < 0.05$), with the prevalence of lameness (12.5%) and hock wounds (12.8%). Based on the survey, concrete flooring was the most prominent bedding type (80%) followed by the soil type (20%). The type of flooring significantly influenced the slipperiness of the shed ($P < 0.001$). A considerable percentage of cows (36.0%) showed signs of wounds, and floor slipperiness significantly ($P < 0.05$) affected the prevalence of wounds. Lower attention on the quality of feeders (14%) and water troughs (12 %) was observed. Positive welfare attitude towards cows was observed in 66% of farmers. The average score of farmer attitudes (6.12) and stockperson attitude obtained, significantly ($P < 0.001$) affected on the floor quality. According to the microbiological analysis, 48 % of the samples were found to be contaminated with *Bacillus cereus*. The Total Colony Count (TCC) of bacteria and the count of *Bacillus cereus* varied significantly ($P < 0.05$) across different farms. TCC is significantly correlated ($P < 0.05$) with the floor dirtiness of particular farm. However, there was no significant difference ($P > 0.05$) in between the floor type, TCC and Count of *Bacillus cereus*. The current study highlighted the critical welfare issues of dairy cows in Naththandiya area and some of these welfare issues had impact on the quality of raw milk. Therefore, it is essential to improve management practices and increase stockperson awareness to enhance dairy cow welfare and there by the quality of raw milk.

Key Words: Cow welfare, Flooring, Management practices, Milk quality

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