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Assessment of Raw Milk Quality Collected from Suburban Sale Centres in Jaffna District, Sri Lanka

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Abstract

The annual milk production of Sri Lanka is significantly bolstered by the Northern Province, with the Jaffna District playing a particularly vital role in this regard. However, the dairy sector is faced with a major concern in the form of the quality of freshly drawn milk, which has far-reaching implications for both direct domestic consumption and the production of various dairy products. Against this backdrop, the primary objective of this study is to comprehensively evaluate the quality of raw milk and effectively identify instances of adulteration across the suburban areas of Jaffna, Sri Lanka. The study was carried out on 1723 milk samples collected from 25 milk sale centres from 2018 to 2022 and milk composition, microbial quality and adulterants were tested. The data were analysed using one way ANOVA procedure in Minitab. The results revealed that water was the common adulterant (64%) found in milk ranging from 13.8 to 55.38% and it was pronounced in the dry season ($p < 0.05$) than wet season. The mean specific gravity (SG) was 1.025 ± 0.0039 . Only half of the total samples had normal values (1.025 - 1.35) of SG which further validates the water adulteration. Sugar, salt, starch and urea were the other extraneous substances found in insignificant quantity (3, 2, 2 and 1%, respectively). The average values obtained for milk fat, Solid Non-Fat and Total Solid contents were $2.63 \pm 0.87\%$, $7.416 \pm 0.909\%$ and $9.888 \pm 1.464\%$, respectively. The mean values of the milk components were not statistically significant between years. The organoleptic evaluation confirmed that the majority (86%) of the milk samples met the standards for physical properties. Microbial analysis with alcohol and clot on boiling tests ensured the absence of mastitis-causing microbes and the heat stability of the samples. The resazurin test showed promising results (62%) on the hygienic and keeping quality of milk, whereas 38% of the samples were rejected due to high microbial load. This study found water was the primary adulterant and only few samples were detected with other substances. Microbiological and compositional quality of milk was in required standards.

Keywords: Adulterants, Contamination, Compositional quality, Public health

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