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STUDIES ON THE COMPOSITION OF INDIGENOUS BUFFALO MILK
IN SRI LANKA

This thesis is dedicated to

my mother

for her constant encouragement and moral support.

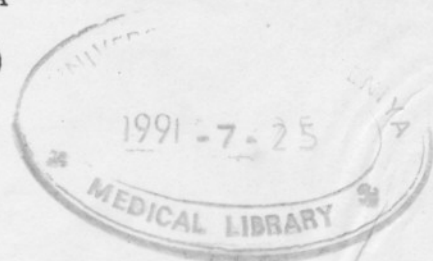
This thesis submitted in accordance with requirements of
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by

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ABSTRACT

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The chemical composition and the physical properties of indigenous (Lanka) buffalo milk were studied using standard techniques in dairy chemistry. A total of 566 samples of milk collected from buffaloes managed under field conditions as well as those maintained in the university experimental farm were analysed in the course of the studies.

The overall values (mean \pm S.E.M.; g/l) of the major constituents of buffalo milk irrespective of the stage of lactation, lactation number and age were: fat 74.5 ± 0.62 ; total proteins, 51.6 ± 0.15 ; casein 44.0 ± 0.19 ; lactose, 43.0 ± 0.02 ; ash, 7.2 ± 0.02 ; solids-not-fat (SNF), 96.2 ± 0.46 ; and total solids, 174.0 ± 0.57 . The average values (mean \pm S.E.M.; mg/l) of the minor constituents studied under the same conditions were: Na, 456 ± 99.6 ; K, 1213 ± 356 ; total phosphorus, 1500 ± 400 ; inorganic phosphate, 1000 ± 200 ; Ca, 1555 ± 350 and Mg, 325 ± 96 . The mean vitamin A content was 1.20 ± 0.1 IU/ml. In these samples, the average pH at 27 C, titrable acidity and ethanol stability were 6.42, 0.202 and 50% respectively. The mean values of the physical properties examined were: specific gravity 1.033 ± 0.003 ; surface tension 46.52 ± 3.46 dynes/cm at 27 C; electrical conductivity, $37.05 \times 10^{-4} \pm 5.00$ mhos at 27 C;

viscosity, 1.9633 ± 0.243 centipoises at 27 C and the fat globular size was 5.10 μm .

The composition of colostrum was markedly different from that of milk. The average value (g/l) for parameters examined were: fat, 63; total proteins, 150; casein, 80; lactose, 30; ash, 11.0; SNF, 200; total solids, 260; vitamin A, 3.30 IU/ml while viscosity was 4.067 ± 0.461 centipoises at 27 C and surface tension was 29.35 ± 1.92 dynes/cm at 27 C.

The average daily milk yield of indigenous buffalo cows estimated by measuring water turn-over in their calves, was 3.58 litres.

The effect of the stage of lactation, lactation number and the age on the composition of milk was examined in 74 animals. All constituents were found to vary with the aforementioned factors except for lactose and ash.

This study represents the first comprehensive analysis of indigenous buffalo milk in Sri Lanka which has attempted to establish norms for the breed. The results also revealed that the fat percentage of the Lanka buffalo was similar to that of the Indian Murrah buffalo while the protein content was high, and comparable to that of the Philippine carabao and the Chinese swamp buffalo. The elevated protein concentration in the Lanka buffalo demonstrated that the alcohol test was not a suitable platform evaluation for this breed.