

Composition of Camels' Milk

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Gujarat State ranked fourth in camel population in India. (Rao *et al.* 1970). Camels are beast of burden particularly in desert areas, but their meat and milk are important source of food for their professional breeders. Yasin and Wahid (1957) reported good milk yielding capacity in camel. However, no systematic data on the milk composition of camel are available in India or in Gujarat. Hence it was thought worthwhile to study the suitability of camel milk for manufacture of indigenous and western dairy products. Preliminary trials were undertaken to ascertain the physico-chemical make-up of camel milk.

Eighteen pooled milk samples were secured from Dormedary species of camel found in Charotar district of Gujarat in midst of their lactation period. The samples were analysed, in duplicate, within 3 hours of milking, for fat content; solids-not-fat content, total milk solids; lactose; protein; whey protein; ash; chloride content; specific gravity; acidity and pH. The analyses were carried out as recommended in Methods of Test for Dairy industry chemical analysis of milk, (IS:1479-II 1961). The milk samples were also subjected to visual examination and

organoleptic evaluation. The average results of the study are depicted in the following table.

TABLE 1

Composition and physical properties of camel milk.

Constituent property	Average value in percentage	Range in percentage
Fat	3.20	2.9 to 3.9
Total solids	9.75	9.16 to 10.53
Solids Not Fat	6.55	6.03 to 6.89
Proteins	2.68	2.54 to 2.78
Casein	2.11	1.83 to 2.28
Whey proteins	0.57	0.43 to 0.77
Lactose	3.20	2.8 to 3.8
Ash	0.60	0.523 to 0.740
Chloride		
Expressed as		
% NaCl	0.25	0.204 to 0.283
Sp. gravity	1.026	1.024 to 1.027
Acidity expressed as %	0.17	0.162 to 0.180
Lactic acid		
pH		6.45 to 6.53

The samples of camel milk on visual examination revealed white colour, opaqueness and higher apparent viscosity. Organoleptically, the taste and smell of camel milk were unpleasant, the former being pronounced salty. This was due to a very high chloride content observed in the milk which ranged from 0.204 to 0.283%.

Average acidity of camel milk after 3 hours of milking was 0.17%. This was much higher than reported by Ohri and Joshi (1961). pH of camel milk ranged between 6.45 to 6.53.

The specific gravity of milk varied from 1.024 to 1.027. In contrast, Khan and Appanna (1964) reported specific gravity value of 1.0374 for camel milk.

Fat content of milk ranged from 2.9 to 3.9% with an average of 3.2%. These values are in close agreement with the results reported by Khan and Appanna (1964). However, the values for fat in present study are relatively lower when compared with one reported by Ohri and Joshi (1961). Protein contents averaged 2.68%, comprising of casein (2.11%) and whey proteins (0.57%). Khan and Appanna (1964) and Ohri and Joshi (1961) have reported 3.76% and 3.95% protein in camel milk, respectively.

Lactose content of the camel milk was found to be very low (3.2%) compared to the results reported by Ohri and Joshi (1961) and Khan and Appanna (1964). Similarly, ash content was also found to be low, averaging 0.6%, of which chlorides alone contri-

buted to the extent of 0.25%. The average total milk solids were 9.75%.

The above results show that the camel milk is relatively, low in milk components, particularly lactose and proteins, and very high in chloride contents, the latter being undesirable from flavour and taste point of view of milk and milk products.

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