

Variations in Milk-Protein of Cows and Buffaloes—Effects of Feeds and Lactation

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Milk protein serves as the source of amino acids for the young ones and the mankind. Webb and Johnson (1965) showed that the foreign bovine milk protein was higher than Indian buffaloes and cows milk protein. Ghosh and Anantakrishnan (1965) showed that buffalo milk was much richer than cow milk in protein content. Numbers of other researchers namely: Hunts (1972), Flam *et al.* (1972), Patel and Shukla (1974), and Desai and Shukla (1974)

have investigated the effect respectively of cottonseeds, carbohydrates, cluster bean, pigeon pea and concentrate mixture on protein content of milk. They found that no significant difference was observed in this constituent.

The present work has been undertaken with a view to study the effect of different feeds, seasonal variations and stage of lactation on the protein content of milk secreted by the local breeds of cows and buffaloes.

The experiment was carried out on twelve Kankrej cows and twelve Surti buffaloes. The animals were subjected to four groups, each consisting of three animals. The grouping was based upon the body weight, FCM yield and stage of lactation. There were no significant differences among the groups.

TABLE 1
Feeding schedule.

Control feeding : Concentrate mixture (25.6 % C.P) plus green grass (NH) 5 kg. per day per head and dry fodder Ad libitum				
Groups	CwA	CwB	CwC	B _F D
	B _F A	B _F B	B _F C	CwD
Feeding Schedule	Concentrate mixture (25.6% C.P.) +Dry fodder ad libitum+5 kg. green grass (NH) per head per day	Concentrate mixture (25.6% C.P.) +Dry fodder ad libitum	Groundnut cake (45.6% C.P.) +Dry fodder ad libitum+5 kg. green grass (NH) per head per day.	Groundnut cake (45.6% C.P.) +Dry fodder ad libitum
	B _F —Buffalo Cw—Cow C.P.—Crude protein NH—Napier hybride		Composition of concentrate Rice bran=30% Maize Gluten=28% Tuwar Chuni=20% Mineral mixture=1% Salt=1% Guvan meal=20%	

The animals in each group received the feed as given in Table-1. The total quantity of feed given to each animal was adjusted according to the nutrient requirements suggested by Sen and Ray (1971). Protein content of pooled milk from a group of animals was estimated weekly by the method of Patel *et al.* (1978).

The average protein contents of milk secreted by cow and buffaloes groups are presented in Tables II and III respectively.

TABLE 2

Average protein (%) of milk secreted by Kankrej-cows under different dietary conditions and seasons.

Groups		Protein (%)			
		Cw-A	Cw-B	Cw-C	Cw-D
Control/feeding		3.75	3.78	3.72	3.80
Summer	Month				
	March	3.75	3.65	3.85	3.80
	April	3.78	3.65	3.85	3.82
	May	3.70	3.68	3.85	3.85
	June	3.69	3.66	3.84	3.85
Average		3.73	3.66	3.85	3.83
Monsoon	Month				
	July	4.07	4.00	4.20	4.20
	Aug.	4.06	3.98	4.22	4.16
	Sept.	4.08	4.01	4.25	4.17
	Oct.	4.10	4.10	4.28	4.19
Average		4.08	4.02	4.24	4.18
Winter	Month				
	Nov.	4.03	4.01	4.00	4.03
	Dec.	4.01	4.01	4.05	3.98
	Jan.	4.02	4.00	4.05	3.98
Average		4.02	4.01	4.03	3.99

Average least significant differences at 5%

Treatment	Summer	Monsoon	Winter
Feeds C.D.	0.048	0.056	0.048
Seasons C.D.	0.35	0.38	0.39

tively. During the control feeding of the concentrate mixture, 5 kg. green grass and dry fodder ad libitum, to both the breeds of animals, it was noted that the milk protein of various groups did not vary significantly. These data suggested that the grouping of animals was satisfactory. It is also revealed that the average protein content (~4.0%) of buffalo-milk was higher than that (~3.76%) of cow-milk. This confirms the observation noted by Ghosh (1965).

TABLE 3

Average protein (%) of milk secreted by Surti-buffaloes under different dietary conditions and seasons.

Groups		Protein (%)				
		B _F A	B _F B	B _F C	B _F D	
Control feeding			4.00	4.00	3.98	3.98
Summer	Month					
	March		4.15	4.00	4.20	4.15
	April		4.09	4.10	4.25	4.17
	May		4.21	4.12	4.22	4.16
	June		4.14	4.15	4.22	4.15
Average			4.15	4.09	4.22	4.16
Monsoon	Month					
	July		4.23	4.20	4.25	4.18
	August		4.25	4.18	4.28	4.22
	Sept.		4.26	4.22	4.34	4.26
	October		4.22	4.19	4.35	4.32
Average			4.24	4.20	4.30	4.25
Winter	Month					
	November		4.20	4.18	4.15	4.11
	December		4.04	4.04	4.05	4.10
Average			4.12	4.11	4.10	4.10

Average least significant differences at 5%

Treatment		Summer	Monsoon	Winter
Feeds	C.D.	0.058	0.028	0.032
Seasons	C.D.	0.15	0.15	0.15

In the feeding trial, animals in groups A and B were given the same feed as that given during the control period, except green grass to group-B animals. The average protein content in milk of Cow-A (3.73%) was significantly higher than that (3.66%) of Cow-B in Summer. The protein content increased significantly in Monsoon for both these cow groups. The average protein per cent in milk has been found to decrease non-significantly in Winter for both Cow-A and Cow-B.

The cow group C and D both received GN cake and dry fodder. The cows in group C were given green grass supplementation. Nonsignificant variation occurred in the average protein contents in milk of these two groups. In monsoon it increased significantly and then decreased in winter.

During winter the protein contents did not vary significantly for all the four groups of cows.

The protein contents in milk of buffalo groups followed similar trend

during summer as that observed for cow groups. It increased nonsignificantly during monsoon and then decreased during winter for all the four groups of buffaloes.

The results on the protein contents in milk of both the breeds suggested that variations occurred in this constituent of milk. The GN-cake feeding to animals resulted in a significant increase of milk protein of both the breeds. The milk-protein of the buffalo groups was more than that of the cow groups. Green grass supplemented groups had higher protein content in milk than those not supplemented with green grass. In the later period of lactation winter of cows and buffaloes, the milk protein did not show much variation. These data and the variations in milk protein allow to interpret that there are cumulative effects of the stage of lactation, the feeds and the physiology of animals.

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