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Nutrient Availability to Lactating Cows and Buffaloes in Mau District of Uttar Pradesh

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Abstract

A survey about the nutrient availability of lactating cows and buffaloes carried out in Mau district of Uttar Pradesh revealed that milk production in cows and buffaloes on the basis of land holding of the farmers, categorizes as landless (group 1), marginal (group 2), small (group 3) and middle (group 4) were significantly the lowest in group 4 ; however, there was non-significant differences amongst groups 1, 2 and 3. Mean values of intakes of green fodder and dry fodder were also significantly the lowest in group 4 with non-significant variation in other three groups in cows and buffaloes. However, the average amount of intake of wheat bran and cake did not vary in any groups of cows, though the intake of cake in buffaloes was significantly the lowest in group 4. Water intake could not vary irrespective of categories of farmers or breeds of animals. Intake of dry matter (DM) and total digestible nutrients (TDN) in cows and buffaloes were also significantly the lowest in group 4 though there was non-significant variations in other three groups. But the intake of digestible crude protein (DCP) in cows was significantly the highest in group 3 followed by groups 2, 4 and least in group 1. The DCP intake in buffaloes was non-significant irrespective of categories of farmers. The amount of DM was surplus in cows and buffaloes of all categories of farmers ; however, the amounts of DCP and TDN were deficit both in cows and buffaloes of all categories of farmers.

Key words : Nutrient availability, Lactating cows, Buffaloes.

Livestock farming is an integral part of agricultural operation in a predominantly agricultural country like India. Like soil and climate, there is great diversity of livestock breeds.There are large numbers of cattle (201 million), buffaloes (90 million) and other livestock including sheep and goats (1). The better types of livestock are usually found in the tracts having large grazing areas which are generally irrigated ; however only one third of the total cultivable area of about 16.3 million hectares is irrigated (2). Thus rest of land is dependent for irrigation on rain and due to irregular and unequal distribution of rainfall, natural calamities like draught or floods appear. During such period, livestock population is greatly affected due to non-availability of feeds and fodders (3) in addition to the reason that there is a large gap between the supply and demand of fodders (green and dry) and concentrates for proper nutrition of livestock. With the increase in the cost of feed inputs and decrease in the grazing land in rural areas, the nutritional status of livestock has been adversely affected. So, the present study was aimed to assess the feeding system that existed till today for milch cows and buffaloes in the villages of Mau district of Uttar Pradesh and to assess the nutritional status of these animals.

Methods

A survey regarding feeding practices followed by farmers for milch cows and buffaloes was carried out during October to April, in ten villages viz. Semarijamalpur, Majhawara, Khaira, Luduhi, Sultanpur, Belasultanpur, Pawani, Adampur, Patila and Moongmass of Mau district of Uttar Pradesh. A total of 156 cows and 203 buffaloes population in the area were surveyed. The data about actual quantity of feeds and fodder offered in a day, measurements of heart girth and length and actual milk production level per day were collected with the fair degree of precision on a questionnaire (4). Measurements about feed and milk were made consecutively

Table 1. Feeding practices done by different categories of farmers for milch cows and buffaloes.

		Cows Categories of farmers (groups)				Buffaloes Categories of farmers (groups)			
	Attributes	Land-less 1	Mar-ginal 2	Small 3	Middle 4	Land-less 1	Mar-ginal 2	Small 3	Middle 4
1.	Name of dry fodder fed								
	a. Wheat straw	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	b. Paddy straw	No	No	No	No	No	No	No	No
	c. Other	No	No	No	No	No	No	No	No
2.	Berseem fodder feeding during study period	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3.	Making concentrate mixture								
	a. Own preparation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	b. Purchased	No	No	No	No	No	No	No	No
4.	Concentrate mixture soaking before feeding	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5.	Feeding of mineral mixture	No	No	No	No	No	No	No	No
6.	Times roughage feeding (1, 2, 3 or 4)	2	2	2	2	2	2	2	2
7.	Time of concentrate feeding								
	a. Before milking	No	No	No	No	No	No	No	No
	b. At milking	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	c. After milking	No	No	No	No	No	No	No	No
8.	Feeding of common salt	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9.	Times of water supply (1, 2, 3 or 4)	1	1	1	1	1	1	1	1

3 day and the average of each animal was taken into consideration. After the data collection, the cows and buffaloes were grouped based on the land holdings of farmers (5) viz. landless (zero hectare : group 1), marginal (upto 1.0 hectare : group 2), small (1.1 to 2.0 hectares : groups 3) and middle (2.1 to 4.0 hectare : group 4). The plane of nutrition of these cows and buffaloes was estimated on the basis of amount of dry matter of individual feed ingredients consumed, their proximate composition, analyzed as per (6), quantities of digestible nutrients they contained by taking the standard values from compositional tables (7, 8). The nutrient requirement of all the animals was calculated for the level of milk production and body weight with the help of nutrient requirement tables (9). Finally, the estimated supply of nutrients was compared with the actual requirements calculated and balance of nutrients was worked out. Then, the data were statistically analyzed (1).

Results and Discussion

Feeding System

It was found that all the farmers, irrespective of their land holding capacities, were adopting the old traditional practices of feeding wheat straw ; some green fodder, particularly green berseem during the study period ; some screenings and brans of wheat and mustard cake in the form of "Sanni" (Table 1). Sanni is the form of feeding straw/roughages with some oil cake either individually or mixed with some crushed grain, bran previously soaked in water and then mixed with it at the time of feeding. This practice of feeding straw is most commonly followed in Punjab, Haryana, UP and Bihar. Our results are in the line with earlier workers (11, 12). None of the farmers followed the practice of mineral mixture feeding.

It was observed that quantity of green fodder and dry fodder ingested by the milch animals, irrespective of breeds, were significantly ($P < 0.05$) the lowest in group 4 ; however, there was non-significant difference amongst groups 1, 2 and 3. Through the exact relationship of roughage feeding and land holding is not clear (13) but found almost similar trend of availability of green fodder to milch animals maintained by landless, marginal, small, medium and large farmers in Punjab ; and the maximum quantity of green

Table 2. Feeding system and nutrients supply (kg/day) to milch cows and buffaloes by different categories of farmers. a, b, c, d different superscripts in a row differ significantly ($P < 0.05$).

		Cows Categories of farmers (groups)				Buffaloes Categories of farmers (groups)			
	Attributes	Land-less 1	Mar-ginal 2	Small 3	Middle 4	Land less 1	Mar-ginal 2	Small 3	Middle 4
1.	a. Number of cows	63	67	20	06	85	83	28	07
	b. Number of cows (%)	40.40	42.90	12.80	3.90	41.90	40.90	13.80	3.40
2.	Dry fodder intake	4.20^{b}	3.40^{b}	3.80^{b}	2.10^{a}	5.10^{b}	4.60^{b}	4.50^{b}	2.60^{a}
3.	Green fodder intake	5.30^{b}	5.20^{b}	5.64^{b}	3.16^{a}	5.59^{b}	5.42^{b}	5.80^{b}	3.36^{a}
4.	Wheat bran intake	0.70	0.80	1.03	0.60	0.77	0.77	1.08	0.64
5.	Oil cake intake	0.39	0.40	0.47	0.27	0.41^{b}	0.42^{b}	0.52^{b}	0.29^{a}
6.	Fresh water intake (liter/d)	21.90	19.90	19.60	10.70	23.70	20.50	20.80	11.40
7.	Milk yield	4.50	4.40	4.60	2.80	6.80^{b}	5.90^{b}	5.80^{b}	2.60^{a}
8.	DM intake	6.40^{b}	6.20^{b}	6.50^{b}	3.70^{a}	7.32^{b}	6.98^{b}	7.24^{b}	4.15^{a}
9.	DCP intake	0.204^{a}	0.380^{b}	0.512^{c}	0.215^{a}	0.273	0.291	0.502	0.362
10.	TDN intake	3.110^{b}	2.969^{b}	3.193^{b}	1.668^{a}	3.501^{b}	3.207^{b}	3.586^{b}	2.000^{a}
11.	DM balance	0.470^{ab}	0.363^{b}	0.598^{b}	0.412^{ab}	0.318	0.229	0.260	0.246
12.	a. DCP balance	–0.283^{a}	–0.088^{b}	0.037^{a}	– 0.057^{c}	– 0.362	– 0.262	–0.054	0.090
	b. DCP balance (%)	– 58.1	– 19.1	7.8	– 21.0	– 57.0	– 47.0	–9.7	33.0
13.	a. TDN balance	– 1.436	– 1.300	– 1.163	– 1.810	– 2.267^{a}	– 1.871^{ab}	– 1.513^{b}	–0.567^{c}
	b. TDN balance	– 31.6	– 30.5	– 26.7	– 73.0	– 39.3	– 36.8	–29.7	–22.1

fodder and dry fodder supplied to animal was 32.23 and 6.29 kg/head per day (14). Lower supply to green fodder might be due to non-availability of land or less fertile land being spared for fodder production. The landless farmers workers got a piece of land on lend from medium farmer specially for green fodder cultivation. Intakes of wheat bran, oil cake and water did not vary in cows due to categories of farmers. Intakes of wheat bran and water in buffaloes followed the similar trend as in cows ; however, intake of oil cake in buffaloes was significantly (P<0.05) lowest in group 4, though there was non-significant variation in groups 1, 2 and 3. Similar trend of concentrate feeding had been found earlier (13—15). They reported a maximum quantity of 1.81 kg/head per day of concentrate feeding by large farmer, though there was non-significant difference in concentrate feeding amongst the other land holding categories of farmers. Our study also followed the similar trend probably due to milk supply and augment cash income by all the farmers of the different categories (16).

Distribution of Animals

Table 2 reveals that majority of the milch cows and buffaloes (83-84%) were reared by landless and marginal land holding farmers, 13-14% by small farmers and only 3-4% by middle farmers. The percentage of milch cows and buffaloes reared by different categories of farmers (Table 2) was almost equal. Similar findings had been reported earlier (15) where cows and buffaloes were in equal proportion and they were higher in landless and marginal farmers than other categories of farmers ; however the result was contrary to findings of Tripathi et al. (17), where the number of cows was higher than buffaloes.

Supply of Nutrition

The dry matter intake for the each feed ingredient was calculated for individual animals and plane of nutrition of cows and buffaloes calculated in terms of digestible crude protein (DCP) and total digestible nutrients (TDN) (Table 2) revealed that these animals were supplied deficient amount of protein and energy at the time of survey. The extent of deficiency of DCP in cows was 58.1, 19.1 and 21.0% in groups 1, 2 and 4 ; though it was positively balanced (7.8%) in group 3. The TDN was also negatively balanced and the extent of deficiency was 31.6, 30.5, 26.7 and 73.0% in groups 1, 2, 3 and 4, respectively.

DCP in buffaloes was deficient by 57.0, 47.0 and 9.7% in groups 1, 2 and 3 ; however, it was positively balanced (33.0%) in group 4. The TDN was also deficient in buffaloes which ranged between 22.1 to 39.3% in four categories of farmers. The deficiency of protein and energy was exhibited in all categories of farmers, except surplus DCP in group 3 for cows and in group 4 for buffaloes, when compared with standards (7, 9).

The deficit supply of DCP and TDN in milch cows and buffaloes, irrespective of variations in the land holding, might be due to poor scientific concept of livestock feeding by the farmers (18), availability of poor qualities of resources and tendency to neglect the animals (19, 20).

Supply of DM was surplus in all the land holding groups irrespective of two categories of breed. Similar findings had been reported earlier (14, 20) probably due to adequate supply of feed stuffs. Water intake had non-significant variation due to size of land holding, but the quantity of water intake was more in milch buffaloes than cows probably due to larger body size and higher milk production.

The milk yield ranged from 2.8 to 4.6 kg/head per day in cows and 2.6 to 6.8 kg/head per day in buffaloes. Milk yield in cows did not differ significantly in various categories of farmers, however, in buffaloes, it was significantly ($P < 0.05$) lowest in group 4 but there was no variation in groups 1, 2 and 3. Higher milk production per bovine in the landless milk producers than the producers with larger farms or higher wet average of buffalo in landless households than others had also been reported (15, 21—23).

Thus it is indicated that supply of DM was surplus, while availability of DCP and TDN was deficit than requirement in milch cows and buffaloes, irrespective of categories of farmers.

References

1. Chatterjee A. K. 1999. Indian meat industry—A study. Proc. Nat. byproducts for value addition. Cen. Food Tech. Res. Inst., Mysore, India, pp. 1—12.
2. Anonymous. 1995. Agricultural statistics at a glance. Direc. Econ. and Stat. Dep. Agric. and Coop., Min. Agric., Govt. of India, New Delhi, India.
3. Preston R. and R. A. Leng. 1987. Matching ruminant production system with available resources in the tropics and subtropics. Penambul Books, Armidale, Australia.
4. Sharma R. J. 1987. Pashuon Ki Dincharya. *In* Pashudhan Prabandhan. Direc. Publ. G. B. Pant Univ. of Agric. & Tech. Pantnagar, India, pp 467—517.
5. Siwatch R. 1989. Economic analysis of buffalo keeping in Rohtak district of Haryana. M. Sc. thesis, N. D. R. I. Karnal, India.
6. AOAC. 2000. Official methods of analysis, 17th edition Assoc. off. Anal. Chem., Washington, DC, USA.
7. Arora S. P. 1978. Feeding of dairy cattle and buffaloes. ICAR Publ., New Delhi, India.
8. Ranjhan S. K. 1991. Chemical composition and nutritive value of Indian feeds and feeding of farm animals. ICAR Publ., New Delhi, India.
9. Pathak N. N. and D. N. Verma. 1993. Nutrient requirements for buffaloes. Int. Book Distrib. Co., Lucknow, India.
10. Snedecor G. W. and W. G. Cochran. 1994. Statistical methods, 8th edition Iowa State Univ. Press, Ames, Iowa, USA.
11. Agrawal S. B. and K. N. S. Sharma. 1986. Dairy management practices of bovine in key-village and non-key-village area around Karnal. Indian J. Dairy Sci. 39 : 6—12.
12. Lall D., V. B. Dixit, T. R. Chauhan and V. S. Solanki. 1998. A critical analysis of the feeding system of lactating buffaloes in Hisar. Indian J. Anim. Prod. and Manag. 14 : 164—166.
13. Singh C. B., R. K. Patel and R. Prasad. 1981. Production potential of fodder and supply of nutrients. Indian Dairym. 33 : 169—173.
14. Handa M. C. and R. S. Gill. 1989. Nutritional status of dairy animals kept by different categories of farmers in Punjab State. Indian J. Anim. Nutr. 6 : 38—43.
15. Roy M. P. 1989. A study on feeding of buffaloes in selected villages near BHU campus. M. Sc. thesis, BHU Varanasi, India.
16. Jackson M. G. 1983. A strategy for improving the productivity of livestock in the hills of UP Proc. of Sem. on environmental regeneration in the Himalayas—Concepts and strategies, Oct. 24—26, Nainital, India.
17. Tripathi R. S., J. S. Garg and G. N. Singh. 1986. An economic analysis of dairy enterprise in Bundelkhand region of UP. Indian J. Dairy Sci. 39 : 17—23.
18. Sharma K. N. S. and S. B. Agrawal. 1979. Estimation of milk production and feed consumption in bovines around Marnal. Indian J. Dairy Sci. 32 : 362—368.
19. Randhe S. R., M. A. Gaffar, S. K. Auradkar and S. V. Deshmukh. 1993. Nutritional status of buffaloes in rural area of Prabhani district of Manarastra state. Indian J. Anim. Nutr. 10 : 127—131.
20. Singh A. K., V. K. Vidyarthi, D. N. Verma and S. N. Lal. 1998. Nutritional status of buffaloes in rural areas of Azamgrah district of UP. Indian

J. Anim. Nutr. 15 : 126—128.
21. Prabhakaran R. and S. N. Sivaselum. 1986. A study on marketed surplus and supply function for milk in Chengalpattu district of Tamil Nadu. Indian J. Dairy Sci. 39 : 13—16.
22. Bhanja S. K. 1989. Livestock development for rural poor. Kurukshetra 37 : 13—18.
23. Singh L. and J. Chatterjee. 1989. Impact of dairy co-operatives on production, consumption and market surplus of milk. Indian Dairym. 41 : 57—63.