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Feeding practices and nutritional status of buffaloes in Charkhi Dadri district of Haryana

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Abstract

A detailed survey was carried out to record feeding practices and nutritional status of lactating buffaloes in Charkhi Dadri district of Haryana state. The survey was conducted during rabi season from January, 2019 to February, 2019. Twelve villages, representing all the blocks of the district were selected for the survey. Samples of feedstuffs, milk, hair and blood were collected from five families from each category of farmers i.e. belonging to landless category and farmers with land holding in a village. Thus a total of 120 buffaloes were selected for the survey. The study data revealed that in *rabi* season, berseem was the most preferred green fodder (73.3% farmers) fed by farmers of Charkhi Dadri district followed by oat fodder and other grasses. Among dry roughages, wheat straw was fed by majority of farmers (90.8%) in the district. Bajra kadbi and rice straw were also being used by farmers depending on availability in the area. Comparatively higher percentage of farmers belonging to landless category were using bajra kadbi. Wheat grain was the most popular as energy source and was used by 76.7% of buffalo owners followed by bajra grain (44.2%). As protein sources, cotton seed cake and cotton seed were being used by 75% and 47.5% of buffalo owners of landless and farmers with land holding categories, respectively. Comparatively a higher percentage of farmers with land holding (68.3%) were using cotton seeds. Similarly higher percentage of farmers with land holding were using cotton seed cake too. Very few respondents were using mineral mixture (17.5%) and common salt (13.3%) in the ration of their animals. Results showed that average body weight and milk yield of buffaloes of farmers with land holding was 515.27 kg and 11.49 kg per day, respectively which is higher than buffaloes kept by landless farmers (495.10 kg and 8.62 kg/day). Average CP intake of buffaloes of land less farmers was 1.26 kg/day which was 6.67% less than the requirements, whereas, buffaloes of farmers with land holding were receiving 1.67 kg CP per day which is 3.08% more than the requirement. Furthermore, 68.3% and 20% buffaloes of landless farmers and farmers with land holding respectively were receiving less crude protein than required. Average daily TDN intake by buffaloes of landless farmers and farmers with land holding was 7.36 and 8.49 kg, respectively. Daily TDN intake was 0.83% and 1.90% more than requirement in case of landless farmers and farmers with land holding category respectively. However, 51.7% and 31.7% of buffaloes of landless farmers and farmers with land holding were receiving less TDN than their requirement respectively. This imbalance feeding was mainly due to lack of knowledge and awareness among farmers regarding composition of feeds and nutrient requirements of the animals.

Keywords: survey, buffaloes, feeding practices, nutritional status

Introduction

Animal husbandry continues to be an integral part of human life since the start of civilization. Over 65% of the population in India is still living in rural areas and most of them are dependent on agriculture and livestock for their livelihood. Two-third of rural community in India is engaged in livestock rearing. It contributes 4.11% of total GDP and 25.6% of total agricultural GDP of India thus plays a vital role in Indian economy. India has largest buffalo population in the world (108.7 million) and ranks first in the world ^[1]. Buffaloes contribute more than 50% of the total milk production in India but lactation yield per animal is very low. This low yield is mainly due to feeding of poor-quality feeds, particularly crop residues and agro-industrial by-products fed to animals in rural households ^[2]. The main constraint to livestock development is the scarcity and fluctuation in the quality and quantity of the animal feed supply throughout the year. Increased populations and industrialization are making arable land scarce and also a large area of the available arable land is being degraded due to human activities. To exploit the full potential of dairy animals the ration should be balanced but lack of quality feeds is the main constraint in most of developing countries ^[3]. Most of farmers follow traditional feeding practices on the basis of available feeds and fodder. Generally, farmers do not supplement mineral mixture and common salt in ration of animals which cause

deficiency of important minerals which leads to various health problems [4]. Proper feeding of buffaloes may raise their production by 30-40%. Therefore, present study was undertaken to assess the feeding practices of lactating buffaloes and to suggest corrective measures for increased milk production and optimal health.

Material and Methods

Location and Climate

Charkhi Dadri is recently created as 22nd districts of Haryana state in northern India. District Charkhi Dadri is located between 28.5921° N latitude and 76.2653° E longitude respectively. District Charkhi Dadri is located 112.6 km of India

capital New Delhi and 295 km of Haryana capital Chandigarh. The average temperature in Charkhi Dadri is 25.3 °C highest in June and lowest in January. During the year, there is little rainfall in Charkhi Dadri. The average rainfall here is 517 mm.

Selection of farmers

Multi-stage stratified random sampling procedure was adopted for the selection of villages. Four blocks of Charkhi Dadri district namely Badhra, Jhojhu, Bond Kalan and Charkhi Dadri were selected purposively for the survey study. Three villages were purposefully selected from each block representing status of their block and from each village, two categories of farming families i.e. landless farmers and farmers with land holding were randomly selected. From each category of farming family 5 lactating buffaloes per village were selected, thus a total of 120 lactating buffaloes were selected for the study.

Data collection

A questionnaire was prepared keeping in mind the objectives and various dimensions of the study. Individual buffalo owner was interrogated regarding the type of feedstuffs (dry fodder, green fodder, grains, cakes, mineral mixture and common salt) and their amount fed to their animals. The weight of animals was calculated by formula suggested by [5]

Body Wt. (Kg) = 0.000027454 x CG^{2.7}, Where CG is chest girth in centimetre. The samples of straws, fodders and concentrates ingredients offered to animals were collected from each village. Analysis of collected samples was done after drying samples of straws, fodders, and concentrate ingredients, and these were ground and analysed for proximate principles as per [6]

The nutrients requirement of buffaloes was calculated on the basis of their body weight and production performance. The availability of DM, CP, and TDN for each animal was calculated on basis of chemical composition of feed/fodder ingredients and their feed intake. Finally, the nutrient intake of animals was compared with the nutrients requirements [7] to find out their nutrient deficiencies/excesses.

Statistical Analysis

The data were subjected to statistical analysis to draw inferences [8]

Results

The result of proximate composition and nutritive value of different feedstuffs fed to the buffaloes of Charkhi Dadri district has been presented in Table 1. The average values of the feedstuffs corroborated with the values reported by [9]. Variations observed in relation to proximate composition of the feedstuffs might be due to varietal differences, different processing techniques and possible adulterations.

Table 1: Chemical composition (%) and nutritive value (%) of feedstuffs used by farmer of Charkhi Dadri district of Haryana state

Feedstuffs	DM %	CP%	EE%	CF%	NFE%	TDN* %
Wheat straw	89.21 (88.46-91.70)	03.09 (02.62-03.71)	1.02 (0.92-1.43)	35.44 (33.27-37.71)	48.56 (45.62- 50.12)	45.0
Paddy Straw	89.50 (87.83-91.39)	04.40 (03.20-05.17)	1.50 (1.12- 2.87)	41.62 (40.22-43.52)	34.10 (31.07- 37.51)	44.0
Bajra kadbi	86.16 (85.31-88.53)	04.18 (03.06-05.32)	0.94 (0.74-1.25)	34.52 (32.16-41.32)	51.78 (45.21- 53.89)	52.0
Barseem fodder	15.01 (13.47-17.22)	17.33 (16.02-20.43)	1.89 (1.21- 3.16)	22.58 (17.63-24.13)	44.03 (40.82- 49.75)	58.0
Oat fodder	25.50 (22.47-27.31)	07.14 (06.10- 07.85)	2.85 (2.26-3.12)	32.02 (27.94-34.72)	52.51 (49.23- 54.82)	52.0
Grasses/weeds	15.43 (14.11-17.82)	11.50 (09.15-12.41)	1.95 (1.31-2.85)	25.02 (23.64-28.35)	51.65 (48.53-54.73)	50.0
Wheat grain	89.15 (88.15- 91.35)	11.30 (10.55- 11.75)	2.40 (1.89-2.73)	04.55 (3.85-4.90)	77.90 (76.87- 79.21)	85.0
Bajra grain	89.71 (87.50- 90.35)	12.00 (11.50-12.95)	3.42 (3.05-3.85)	03.07 (2.72-3.67)	76.48 (75.04-77.82)	75.0
Cotton seed cake	88.50 (87.20-90.35)	23.63 (22.76-24.75)	8.60 (7.22-9.17)	22.60 (20.15-24.84)	37.62 (33.14-40.36)	75.0
Cotton seed	88.56 (87.14-90.51)	20.10 (19.30-22.14)	17.04 (15.81-19.42)	21.36 (20.17-22.16)	36.87 (34.40- 39.12)	88.0
Feed pellets	88.80 (87.31-91.07)	18.86 (16.54-20.12)	2.68 (1.95-2.96)	12.42 (11.41-14.21)	62.42 (60.70-65.47)	78.0
Gram Churi	90.86 (88.12- 91.82)	12.41 (11.39-15.25)	2.39 (2.09-2.86)	28.41 (24.66- 30.26)	49.27 (47.18- 51.79)	78.0

* Calculated values [9]

Figures in Parenthesis indicate range.

Feedstuffs used by different categories of farmers of Charkhi Dadri district are given in the Table 2. Berseem was the most preferred green fodder fed by of farmer of Charkhi Dadri i.e.

73.3% of farmers were feeding barseem in the district followed by oat fodder and grasses with equal percentage i.e. 23.3%. Comparatively higher percentage of farmers with land

holding (83.3%) were using barseem as chief green source while this percentage was 63.3% in case of landless farmers, while a higher percentage of landless farmers were using grasses and weeds as source of green than the farmers with land holding.

Among dry roughages, it was observed that wheat straw was fed by majority of the farmers (90.8%) while rice straw was used by 23.3% of the farmers in the district. Rice straw and bajra kadbi were being used by farmers depending on availability in the area. Comparatively higher percentage of landless farmers was using bajra kadbi as it was available to them at cheaper cost or in exchange of harvesting labour. It was found that wheat flour/dalia was most popular as source of energy and was used by 76.7% of buffalo owners followed by bajra grain (44.2% of farmers) in the district. As protein sources, cotton seed cake and cotton seed were used by 75%

and 47.5% farmers respectively. Comparatively a higher percentage of farmers with land holding (68.3%) were using cotton seeds reason might be that cotton seed was more costly and farmers with land holding can easily afford it. Similarly higher percentage of land holding farmers were using cotton seed cake. Farmers were using grains and cake after soaking and boiling in water.

Availability and keeping quality of wheat straw made it preferred choice among dry fodder for feeding of their buffaloes^[10]. Very few farmers were providing mineral mixture to their animals. Practice of using mineral mixture was observed comparatively higher among farmers with land holding (23.3%) than landless farmers (11.6%). Farmers generally do not supplement mineral mixture and common salt in animal ration of lactating buffaloes in Rohtak and Bhiwani district was reported^[10] earlier.

Table 2: Comparative feeding plane of different feedstuff used by different categories of farmers of Charkhi Dadri district

Feedstuffs	Landless farmers	Farmers with land holding	Overall
	n = 60	n = 60	n = 120
Oats fodder	13(21.6%)	15(25.0%)	28(23.3%)
Berseem fodder	38(63.3%)	50(83.3%)	88(73.3%)
Grasses	21(35.0%)	07(11.6%)	28(23.3%)
Wheat straw	53(88.3%)	56(93.3%)	109(90.8%)
Rice straw	13(21.7%)	15(25.0%)	28(23.3%)
Bajra kadbi	13(21.7%)	08(13.3%)	21(17.5%)
Wheat flour/dalia	43(71.6%)	49(81.6%)	92(76.7%)
Bajra (grains)	25(41.6%)	28(46.6%)	53(44.2%)
Cottonseed	16(26.6%)	41(68.3%)	57(47.5%)
Cottonseed cake	41(68.3%)	49(81.6%)	90(75.0%)
Gram husk/churi	04(06.6%)	13(21.6%)	17(14.2%)
Feed pellets	03(05.0%)	07(11.6%)	10(08.3%)
Mineral mixture	07(11.6%)	14(23.3%)	21(17.5%)
Common salt	09(15.0%)	07(11.6%)	16(13.3%)

Comparative feeding of different feedstuffs in different blocks of Charkhi Dadri district is depicted in Table 3. It was found that use of berseem as green fodder is almost similar in all blocks of Charkhi Dadri district but use of grasses/weeds was more in Bond Kalan block (26.7%) in comparison to other blocks. Most of the farmers of all the blocks were using wheat straw preferably but feeding of rice straw was highest in Bond Kalan and Charkhi Dadri (33.3%) blocks and lowest in Badhra block (10.0%) because soil type and water availability in Bond Kalan and Charkhi Dadri blocks are suitable for rice cultivation. Bajra kadbi was used more in Badhra and Jhojhu block and 26.6% and 20.0% farmers were feeding bajra kadbi,

respectively. Bajra cultivation was comparatively higher in these blocks due to less facility of irrigation in these areas and its production required less water than other crops. Most of the farmers were feeding wheat flour/dalia to their animals in all the blocks, however farmers of Badhra and Jhojhu blocks were also using bajra grain and 50% and 60% farmers in these blocks were using bajra grain, respectively. Cotton seed cake was more preferred in Charkhi Dadri block (86.7%) and cotton seed was more preferred in Badhra block (53.3%). Only a few farmers (17.5%) were using mineral mixture in the animal ration. Similar pattern of mineral mixture use was observed in all the blocks of the district.

Table 3: Comparative feeding of different feedstuffs in different blocks of Charkhi Dadri District

Feedstuffs	Blocks			
	Bond Kalan (n=30)	Charkhi Dadri (n=30)	Badhra (n=30)	Jhojhu (n=30)
Oats fodder	05 (16.7%)	06 (20.0%)	10 (33.3%)	07 (23.3%)
Barseem fodder	22 (73.3%)	23 (76.7%)	21 (70.0%)	22 (73.3%)
Grasses/ weeds	08 (26.7%)	07 (23.3%)	07 (23.3%)	06 (20.0%)
Wheat straw	27 (90.0%)	26 (86.7%)	28 (93.3%)	28 (93.3%)
Rice straw	10 (33.3%)	10 (33.3%)	03 (10.0%)	05 (16.7%)
Bajra kadbi	03 (10.0%)	04 (13.3%)	08 (26.6%)	06 (20.0%)
Wheat flour/dalia	19 (63.3%)	22 (73.3%)	27 (90.0%)	24 (80.0%)
Bajra	11 (36.7%)	09 (30.0%)	15 (50.0%)	18 (60.0%)
Cotton seed	12 (40.0%)	15 (50.0%)	16 (53.3%)	14 (46.7%)
Cotton seed cake	18 (60.0%)	26 (86.7%)	24 (80.0%)	22 (73.3%)
Gram churi	04 (13.3%)	07 (23.3%)	03 (10.0%)	03 (10.0%)
Feed pellets	02 (06.7%)	03 (10.0%)	02 (06.7%)	03 (10.0%)
Mineral mixture	05 (16.7%)	06 (20.0%)	05 (16.7%)	05 (16.7%)
Common salt	03 (10.0%)	04 (13.3%)	05 (16.7%)	04 (13.3%)

The comparative feeding plane of milch buffaloes of owned by different categories of farmer is presented in Table 4. During survey it was found that people were not aware of scientific feeding practices and nutrient requirements. Majority of farmers were offering concentrate to only lactating buffaloes and concentrate was composed of easily available ingredients like wheat and bajra.

The comparative feeding plane of milch buffaloes owned by different categories of farmers of Charkhi Dadri district

revealed that the average body weight of buffaloes owned by landless farmers and farmers with land holding was 495.10 kg and 515.27 kg., respectively. The body weight was higher in case of buffaloes owned by farmers with land holding. Further, it was found that the average milk yield of buffaloes owned by farmers with land holding was higher (11.49 kg/day) as compared to land less farmers (8.62 kg/day). Similar observation were reported earlier in Gurgaon district of Haryana [11].

Table 4: Comparative feeding plane and nutrient intake of animals of different categories of farmers of Charkhi Dadri district

Attribute	Landless farmers	Farmers with land holding
Average body weight of buffaloes (Kg)	495.10 ± 4.20	515.27 ± 3.44
Average milk yield (Kg/day)	8.62 ± 0.56	11.49 ± 0.41
Total DM intake (Kg/day)	12.04 ± 2.22	14.31 ± 2.00
Total DM required (Kg/day)	13.61 ± 0.11	14.17 ± 0.09
DM deficit /excess (%)	- 11.53%	+ 1.0%
Animal underfed in respect of DM	36 (60.0%)	23(38.3%)
Total CP intake (Kg/day)	1.26 ± 0.05	1.67 ± 0.04
Total CP required (Kg/day)	1.35 ± 0.05	1.62 ± 0.03
CP deficit /excess (%)	-6.67%	+3.08%
Animals underfed in respect of CP	41 (68.3%)	12 (20.0%)
TDN (Kg/day)	7.26 ± 0.18	8.67 ± 0.13
Total TDN Required (Kg/day)	7.20 ± 0.24	8.49 ± 0.18
TDN deficit /excess (%)	+0.83%	+1.90%
Animal underfed in respect of TDN	31(51.7%)	19 (31.7%)

The total dry matter intake was more in case of buffaloes of farmers with land holding (14.31kg/day) than buffaloes of landless farmers (12.04kg/day). On average buffaloes of landless farmers were receiving 11.53% less dry matter than required. Furthermore, 60% buffaloes of land less farmers were underfed in respect of dry matter.

Average crude protein intake of buffaloes of landless farmers was 1.26 kg/day which was 6.67% less than the requirements. Whereas, buffaloes of farmers with land holding were receiving 1.67 kg CP per day which is 3.08% more than the requirement. Furthermore, 68.3% and 20% buffaloes of landless farmers and farmers with land holding respectively were receiving less crude protein than required.

Average daily TDN intake by buffaloes of landless farmers and farmers with land holding was 7.26 and 8.67 kg, respectively. Daily TDN intake was 0.83% higher in case of landless farmers and it was 1.90% higher than requirement in case of farmers with land holding category. However, 51.7% and 31.7% of buffaloes of landless farmers and farmers with land holding were receiving less TDN than required. This imbalance feeding was mainly due to lack of knowledge and awareness among farmers about composition of feed ingredients and requirements of the animals.

Conclusion

Results of the present investigation reveal that body weight, milk yield and dry matter intake in lactating buffaloes of farmers with land holding were higher as compared to those reared by landless farmers. A high number of buffaloes reared by both landless and farmers with land holding were receiving ration deficient both in energy and protein. Only a few farmers of the district were using mineral mixture and common salt as nutritional supplement. An approach of balanced feeding and mineral mixture supplementation could be resorted to fill the nutritional gap and optimize milk production in the district.

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