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## Assessment of feeding practices and nutritional status of lactating buffaloes in Jhajjar district of Haryana

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#### Abstract

A survey was conducted to assess the feeding practices and plane of nutrition of lactating buffaloes in Jhajjar district of Haryana state. The survey was conducted in January - February, 2019. For this 15 villages were randomly selected, three villages from each of five blocks of the district, which were geographically located apart and truly represented the animal husbandry practices of blocks. The data were collected from 150 buffalo owners belonging to two different categories of farmers i.e. having land holding more than or less than 5 acres. The survey data revealed that in *Rabiseason*, berseem was the most common (82.6%) green fodder fed by of farmer of Jhajjar district followed by grasses (32%) and oat fodder (26%). Majority of buffalo owners were using wheat grain (88.7%) as chief source of energy and cotton seed (81.3%) and cottonseed cake (80%) as major source of protein. The respondents were occasionally providing common salt (25.3%) and rarely mineral mixture (16%) to their animals. Results showed that average body weight and milk yield of families having land holding >5 acre is 495.80 kg and 9.99 kg per day, respectively which is higher than families having land holding <5 acre (478.30 kg and 8.47 kg/day). Average CP intake of buffaloes of farmers with less land holding was 1.21 kg/day which was 3.93% less than the requirements, whereas, buffaloes of farmers with large land holding were receiving 1.45 kg CP per day which is 2.11 % more than the requirement. It may be inferred that majority of buffaloes under the study were underfed in terms of DM and proteins but fed adequately in terms of TDN.

**Keywords:** Survey, buffaloes, feeding practices, nutritional status

#### Introduction

Livestock and agriculture sector are complimentary to each other. Livestock plays an important role in Indian economy. It provides livelihood to two-third of rural population and provides employment to about 8.8 per cent of the population in India. India's livestock sector is one of the largest sectors in the world, having 56.7% of world's buffaloes, 12.5% cattle and 20.4% small ruminants. The buffalo holds an important place in Indian rural economy contributing about 60% of total milk production in the country. Owing to better feed conversion efficiency, more resistance to diseases and higher milk fat percentage, they are preferred over cattle<sup>[2]</sup>. Feeding plays a very important role in exploiting the full potential of dairy animals but scarcity of quality feeds is the main constraint in livestock development<sup>[4]</sup>. The crop residues and agro-industrial by-products which are deficient in protein and minerals form the bulk of the ration resulting in less availability of nutrients to the lactating animals. The inadequate supply of nutrients and imbalance feeding limits the availability of nutrients to the animal during critical period of their production cycle. Majority of farmers follows 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 reproductive and health problems. Proper feeding of buffaloes raises their production to 30-40 %. Therefore, present study was undertaken to assess the feeding practices of lactating buffaloes and advocating suitable corrective measures for optimal health and increased buffalo production

#### Material and Methods

##### Location and Climate

Jhajjar is situated at 28.62° N 76.65° E on the road connecting Rewari to Rohtak (NH-71). The climate of the district resembles to that of tropical regions with hot summer and cold winters. The temperature here averages 25.3° C, highest in June and lowest in January. The average rainfall in a year is 481 mm.

### Selection of farmers

Multi-stage stratified random sampling procedure was adopted for the selection of villages. Five blocks of Jhajjar district namely Bahadurgarh, Beri, Jhajjar, Salhawas and Matenhel were selected purposively for the survey study. Three villages were randomly selected from each block and from each village, two categories of farming families i.e. family having land holding > 5 acre and family having land holding < 5 acre were randomly selected. From each category of farming family 5 lactating buffaloes per village were selected, thus a total of 150 lactating buffaloes were selected for the study.

### Data collection

A questionnaire was prepared keeping in mind the objectives and various dimensions of the study. The data were collected from the individual buffalo owner through personal interview regarding the type of feedstuffs (dry fodder, green fodder, grains, oilseed cakes, mineral mixture and common salt) and their amount fed to their animals. The weight of animals was calculated by formula suggested by <sup>[5]</sup>  

$$\text{Body Wt. (Kg)} = 0.000027454 \times \text{CG}^{2.7}$$
 Where CG is chest girth in centimetre. The represented samples of straws, fodders and concentrates ingredients offered to animals were collected

from each village. The dried samples of straws, fodders, and concentrates ingredients were ground to pass through 1mm sieve, pooled and analysed for proximate principles as per <sup>[1]</sup>. 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 nutrients intake of animals was compared with the nutrients requirements <sup>[6]</sup> to work out their nutrient deficiencies/excesses.

### Statistical Analysis

The data will be subjected to statistical analysis to draw inferences. Correlation between the variables will be computed as per

### Results

The result of proximate composition and nutritive value of different feedstuffs fed to the buffaloes by farmers of Jhajjar district has been presented in Table 1. The average values of the feedstuffs corroborated with the values reported by <sup>[7]</sup>. 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 Jhajjar district of Haryana state

Feedstuffs	n	DM %	CP%	EE%	CF%	NFE%	TDN* %
Wheat straw	30	90.13 (87.3-91.80)	3.39 (2.45-3.85)	1.33 (1.04-1.58)	36.89 (34.24-39.78)	46.20 (42.78- 49.22)	45.0
Paddy Straw	30	89.16 (87.35- 91.56)	3.28 (2.85-3.70)	2.10(1.13- 2.94)	38.95 (36.68- 42.41)	34.64 (32.05- 41.86)	44.0
Bajra kadbi	30	89.97 (88.32-91.82)	3.95 (3.20-4.90)	1.17 (0.89-1.37)	40.33 (38.48- 42.52)	42.97 (39.83- 45.38)	52.0
Jowarkadbi	30	90.46 (86.26- 92.17)	4.12 (3.26-5.35)	1.25 (1.15-1.86)	36.41 (33.46- 40.58)	51.42 (42.23- 56.45)	55.0
Barseem fodder	30	15.55 (13.56- 17.52)	17.45 (15.05-20.3)	2.90 (2.41- 3.13)	18.70 (15.53- 21.89)	46.15 (41.90- 50.19)	62.0
Oat fodder	15	23.80 (21.47-25.37)	6.90 (6.30- 7.35)	3.12 (2.85- 3.32)	31.40 (28.68- 34.41)	53.10 (51.22- 55.38)	52.0
Wheat grain	30	89.27 (87.21- 90.65)	11.38 (10.95- 11.85)	2.45 (1.93-2.93)	3.63 (2.34-4.42)	80.71 (78.87- 83.01)	78.0
Bajra grain	15	88.13 (87.05- 89.01)	12.70 (11.80-12.95)	3.70(3.10-3.94)	2.71(2.56-2.94)	79.2078.04-80.52)	75.0
Cotton seed cake	30	89.18 (87.47-90.50)	23.40 (22.55-24.65)	5.89 (5.38-6.33)	22.28 (20.23-23.93)	40.92 (36.15-45.32)	75.0
Cotton seed	30	87.65 (87.07-90.76)	21.65 (20.7-22.76)	14.80(12.87-18.78)	24.50 (22.37-26.16)	37.15 (32.42- 41.30)	88.0
Mustard cake	15	89.76 (88.35-90.21)	34.72 (33.65-35.12)	6.32 (5.87-6.56)	7.76 (7.34-8.10)	45.59(44.78-46.12)	78.0
Gram Churi	15	91.13(88.46- 92.53)	13.64 (12.65-15.6)	2.27 (2.17-2.46)	26.37 (23.66- 27.74)	48.47 (43.68- 51.27)	78.0

\* Calculated values <sup>[7]</sup>

Figures in Parenthesis indicate range.

Feedstuffs used by different categories of farmers of Jhajjar district are given in Table 2. It was observed that berseem was the most common (82.6%) green fodder fed by of farmer of Jhajjar district followed by grass (32%) and oat fodder (26%). Beseem was preferred over other green fodder because it is a legume fodder rich in crude protein content, crop is multicut in nature and have more yield per unit area in comparison to other fodder crops. Mostly green fodder was fed in chopped form by the farmers. Among dry fodders, it was observed that wheat straw was fed by majority of farmers (88%) followed by bajra kadbi, rice straw and jowarkadbi, 40%, 39.1% and 31.3%, respectively. Availability and keeping quality of wheat straw made it first choice dry fodder for feeding of their buffaloes<sup>[10]</sup>. Among concentrate feeds, cotton seed and cotton seed cake were chief source of protein used by 81.3% and 80% of farmers, respectively. Farmers of the study area

believed that inclusion of cotton seed and cotton seed cake in ration of buffaloes increases fat content of milk and also helps in easy separation of butter from milk. It was observed that in winter season farmers did not prefer mustard cake as protein supplement. Only 32% of farmers were using mustard cake as concentrate. Study revealed that wheat grain was used as chief source of energy used by 88.7% of buffalo owners followed by bajra grain. The concentrates were mostly fed to lactating buffaloes twice a day at the time of milking for easy handling of animals during milking. Generally soaked form of concentrate was preferred. Use of mineral mixture and common salt was seldom and practiced by only 16% and 25.3% livestock owners, respectively. Limited feeding of mineral mixture and common salt to lactating buffaloes in Rohtak and Bhiwani district was reported <sup>[3]</sup> earlier.

**Table 2:** Comparative feeding plane of different feedstuff used by different categories of farmers of Jhajjar district

Feedstuffs	Families having land holding < 5 acre	Families having land holding > 5 acre	Overall
	n = 75	n = 75	n = 150
Oat fodder	16 (21.3%)	23 (30.7 %)	39 (26.0%)
Berseem fodder	57 (76.0%)	67 (89.3 %)	124(82.6.0%)
Grass/bathua	31 (41.3%)	17 (22.7 %)	48 (32.0%)
Wheat straw	64 (85.3%)	68 (90.7 %)	132 (88.0%)
Rice straw	36 (48.0%)	23 (30.7 %)	59 (39.3%)
Bajra kadbi	34 (45.3 %)	26 (34.7%)	60 (40.0%)
Jowarkadbi	18 (24.0%)	29 (38.7 %)	47 (31.3%)
Wheat grain	63 (84.0%)	70 (93.3 %)	133 (88.7%)
Bajra grain	24 (32.0%)	27 (36.0 %)	51 (34.0%)
Cotton seed	59 (78.7%)	63 (84.0 %)	122 (81.3%)
Cotton seed cake	51 (68.0%)	59(78.7 %)	120 (80.0%)
Mustard cake	18 (24.0%)	30 (40.0 %)	48 (32.0%)
Mineral mixture	07 (9.3%)	17 (22.7 %)	24 (16.0%)
Common Salt	14 (18.7%)	23 (30.7 %)	37 (25.3%)

Families having land holding more than 5 acres preferred berseem as a green fodder. Grass/Bathua was used by 41.3 % of families having land holding less than 5 acres. Wheat straw was commonly used by families of both categories but use of bajra kadbi was higher in families having land holding less than 5 acres (45.3%) as compared to those having land holding more than 5 acres (34.7%) because chopping of bajra stem is a laborious work which was avoided by owner of large land holding. Feeding of concentrate feeds was observed comparatively more in families having land holding more than 5 acres. Higher cost of concentrate feeds as a constraint to family having land holding less than 5 acre which limit amount of concentrate feed incorporation in the ration of their animals. Mineral mixture and common salt is used by only 9.3% and 22.7%, respectively by farmer having land holding less than 5 acre, however, use of mineral mixture and common salt was higher (18.7% and 30.7% respectively) by farmers having land holding more than 5 acres.

Study revealed that use of berseem fodder as green roughage is almost similar in all blocks of Jhajjar district but use of grasses/bathua was more in Matenhel block (43.3%) in comparison to other blocks. It was also observed that pattern of use of wheat straw was also almost same in all blocks but feeding of rice straw was highest in Jhajjar block (46.7%) and lowest in Salhawas block (33.3%) because of higher production of rice crop in Jhajjar block. Bajra kadbi was preferred more in Salhawas block and Matenhel block i.e. 50% and 46.7% respectively. Bajra production was comparatively higher in these blocks due to less facility of irrigation in these areas and its production required less water than other crop. Pattern of feeding of wheat grain was almost similar in all blocks. Cotton seed was more preferred in Jhajjar block (90%) and cotton seed cake was more preferred in Bahadurgarh block (90%). The feeding of mineral mixture and common salt in the animal ration was very low. Similar pattern of feeding was observed in all blocks.

**Table 3:** Comparative feeding of different feedstuffs in different blocks of Jhajjar District

Feedstuffs	Blocks				
	Bahadurgarh	Beri	Jhajjar	Salhawas	Matenhel
Oat fodder	8 (26.7%)	8 (26.7%)	10 (33.3%)	6 (20.0%)	7 (23.3%)
Barseem fodder	23 (76.7%)	25(83.3%)	23(76.7%)	22(73.3%)	21(70.0%)
Grass(bathua)	9 (30.0%)	7(23.3%)	9(30.0%)	10(33.3%)	13(43.3%)
Wheat straw	27 (90.0%)	26(86.7%)	27(90.0%)	26(86.7%)	26(86.7%)
Rice straw	13 (43.3%)	11 (36.7%)	14(46.7%)	10(33.3%)	11(36.7%)
Bajra kadbi	10 (33.3%)	11 (36.7%)	10(33.3%)	15(50.0%)	14(46.7%)
Jowarkadbi	9 (30.0%)	12 (40.0%)	7(23.3%)	10(33.3%)	9(30.0%)
Wheat grain	28 (93.3%)	25 (83.3%)	27(90.0%)	26(86.7%)	27(90.0%)
Bajra grain	8 (26.7%)	9 (30.0%)	9(30.0%)	13(43.3%)	12(40.0%)
Cotton seed	22 (73.3%)	23 (76.7%)	27(90.0%)	25(83.3%)	25(83.3%)
Cotton seed cake	27 (90.0%)	26 (86.7%)	21(70.0%)	22(73.3%)	24(80.0%)
Mustard cake	12 (40.0%)	10 (33.3%)	8(26.7%)	14(46.7%)	10(33.3%)
Min. mixture	5 (16.7%)	5 (16.7%)	3(10.0%)	3(10.0%)	7(23.3%)
Common Salt	8 (26.7%)	8 (26.7%)	6(20.0%)	10(33.3%)	5 (16.7%)

The comparative feeding plane of milch buffaloes of owned by different categories of farmer is presented in Table 4. It was observed that farmers of the district were not following any scientific practices for feeding and they do not have any knowledge of feeding standard and nutrient requirements. Concentrate was fed mainly on the basis of milk yield of the animal and availability of concentrate feed available in the area.

The comparative feeding plane of milch buffaloes owned by

different categories of farmers of Jhajjar district indicated that the average body weight of buffaloes owned by farmers having small land holding and large land holding was 478.30 and 495.80 kg., respectively. The higher body weight was observed in case of buffaloes owned by large farmers. Further, it was observed that the average milk yield of buffaloes owned by farmers having large land holding was higher (9.99 kg/day) as compared to farmers having less land holding (8.47 kg/day).

**Table 4:** Comparative feeding plane and nutrient intake of animals of different categories of farmers of Jhajjar district

Attribute	Families having land holding < 5 acre (n= 75)	Families having land holding < 5 acre (n= 75)
Body weight of buffaloes (Kg)	478 ± 2.67(455-530)	495 ± 2.69(470- 558)
Milk yield (kg/d)	8.47± 0.24(5- 12)	9.99 ±0.25(6-15)
Total DM intake (Kg/day)	11.685 ± 0.27(7.79- 17.66)	12.96 ± 0.21(8.92- 18.84)
Total DM Required (Kg/day)	12.92 ± 0.07	13.37 ±0.07
DM deficit /excess (%)	- 9.59	- 3.06
Animal underfed in respect of DM	36 (48.0%)	23(30.6%)
Total CP intake(kg/Day)	1.21 ± 0.03(0.76 – 1.84)	1.45± 0.03(0.82 – 2.34)
Total CP required(kg/Day)	1.27 ± 0.02	1.42 ± 0.02
CP deficit /excess (%)	-3.93 %	+2.11%
Animals underfed in respect of CP	41 (54.6%)	36 (48.0%)
TDN (kg/day)	7.21 ±0.24(4.89 - 9.23)	7.94 ±0.13(5.58- 9.89)
Total TDN Required (Kg/day)	6.87± 0.09	7.49 ± 0.10
TDN deficit /excess (%)	+4.94%	+ 6.01%
Animal underfed in respect of TDN	28 (37.3%)	19 (25.3%)

The total dry matter intake was 11.68, and 12.96 kg/day for milch buffaloes of farmers having less land holding and large landholding, respectively which was less than dry matter required 12.92 and 13.37 kg/day by these buffaloes. Observations revealed that on average buffaloes of farmers with less land holding and large land holding were receiving 9.59 and 3.06 % less dry matter than required. Furthermore, 48% buffaloes of farmers with small land holding were underfed in respect of dry matter.

Average crude protein intake of buffaloes of farmers with less land holding was 1.21 kg/day which was 3.93% less than the requirements, whereas, buffaloes of farmers with large land holding were receiving 1.45 kg CP per day which is 2.11 % more than the requirement. Furthermore, 54.6% and 48% buffaloes of farmers with less land holding and large land holding respectively were fed less crude protein than required. Average daily TDN intake by buffaloes of farmers with less land holding and large land holding farmers was 7.21 and 7.94 kg, respectively. On an average, the daily TDN intake was 4.94 and 6.01 % more than requirement in respective category. However, 37.3% and 25.3% of buffaloes of farmers having less land holding and large land holding were receiving less TDN than required. The excess energy fed may be deposited in animal body which might be beneficial during dry period, when low quality roughages constitute the major part of the ration. The results of this study are in general agreement with those reported by [8] who reported that buffaloes in Mohindergarh district were found to be fed 7.54% excess TDN and 7.41 % deficient CP.

### Conclusion

Results of the present investigation inferred that body weight, milk yield and dry matter intake in lactating buffaloes of large farmers were higher as compared to small farmers. A large number of buffaloes reared by both large and small farmers were receiving ration deficient both in energy and protein. Farmers did not supplement mineral mixture and even common salt to their animals. The 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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