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## Assessment of comparative feeding practices in lactating cattle and buffaloes in Jhajjar District of Haryana

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### Abstract

The research was conducted to study the feeding practices and nutritional requirements of cattle and buffalo in Jhajjar district of Haryana. The survey was conducted accordingly during March to April 2021 (*Rabi* season). Jhajjar district was divided into five blocks, from each block, three villages were randomly selected to have a fairly representative sample. In each village, twelve families were approached, six for cattle data and another six for buffalo data under each category, making a total of almost 180 families. Berseem was the commonly used green fodder used by 70% of farmers followed by oat fodder (56.11%) to fed as green fodder to their lactating cattle and buffaloes. In dry fodders, wheat straw was the preferred over all dry fodders and used in every block by most of the farmers (88.88%) followed by kadbi (40%). The average body weight of cattle in Jhajjar district was 387.82 kg, ranged from 345.00 kg to 425.00 kg and the milk yield ranged from 7.00 kg/day to 18.00 kg/day, averaged as 10.4 kg/day. The average body weight of buffaloes was 498.00 kg and the average daily milk yield of buffaloes was 9.64 kg/day. The present studies revealed that the number of cattle and buffaloes deficient in protein were more than the DM and TDN. We found that 40% cattle and 42.22% buffaloes deficient in CP comparing to 26.67% and 27.77% DM deficient and 24.44% and 31.11% TDN deficient, respectively. In total, 12.22%, 16.67%, 100%, 81.11% and 46.67% cattle were deficient in Ca, P, Zn, Cu and Mn, respectively in Jhajjar district. In total, at an average 12.22%, 16.67%, 100%, 81.11% and 46.67% buffaloes were underfed in Ca, P, Zn, Cu and Mn, respectively.

**Keywords:** Buffalo, Cattle, Haryana, Jhajjar

### Introduction

Dairying has become an important secondary source of income for millions of rural families and has assumed the most important role in providing employment and income generating opportunities particularly for marginal and women farmers. Total cattle and buffalo population in the country is 192.49 million and 109.85 million during 2019, respectively (20th livestock census, 2019)<sup>[1]</sup>.

The nutrient requirements of cattle and buffaloes depend upon the body weight of the animal and the amount of milk they yield. However, the type and composition of feedstuffs is decided by composition of soil of the region but the basic nutritive requirement of animal remains the same. Moreover, the mineral status of animal feed, fodder, hair, blood and milk is largely determined by the composition of soil of the region. The major hurdle in livestock development in developing country like India is the scarcity of feed and fluctuation in the quality and quantity of animal feed. Crop residues and agro-industrial by products constitutes the large part of daily ration intake of the animal results in less availability of nutrients to animals as these residues and grasses are deficient in protein and certain minerals. In India, ruminants depend on straw for their maintenance. The production requirement was most often met from protein supplements like groundnut cake, mustard cake or cottonseed cake (Lailer and Singh, 1998)<sup>[4]</sup> and very seldom from compounded concentrate mixture (Prasad *et al.*, 1993)<sup>[7]</sup> which affects the farm economics. The research evidence indicates that animal owners are not accustomed to follow scientific feeding and management practices due to which overall productivity of animals goes down.

### Material and Methods

This study was conducted to assess the comparative and conventional feeding systems and plane of nutrition and the status of minerals in feed, fodder, blood, milk and hair of cattle and

buffaloes in Jhajjar district of Haryana state. The survey was conducted accordingly during March to April 2021 (*Rabi* season). Through personal approach at the doorstep of individual farmers data was collected to get the required information. After collection, samples of feed, fodder, blood and hair, were analyzed in the Department of Animal Nutrition, COVS, LUVAS.

Jhajjar district has five blocks. To have a systematic and planned study, all the blocks were included in the survey. From each block, three villages were randomly selected to have a fairly representative sample. In each village, twelve families were approached, six for cattle data and another six for buffalo data under each category, were interrogated on the prescribed Performa for this study, thus, making a total of almost 180 families. The farmers cooperated well in recording body weight, milk yield, feed intake and answering the questionnaire for collection of data. The samples of feed, fodders, blood and hair were also made available by them for chemical analysis.

A questionnaire was prepared keeping in mind the objectives and various dimensions of the study. Individual cattle and 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 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.

Total digestible nutrients (TDN) content (%) of the feeds and fodders were calculated by using reported values of digestibility coefficients (Sen *et al.*, 1977) <sup>[10]</sup> of respective proximate nutrients (i.e., CP, EE, CF and NFE) of a particular feed ingredient. TDN and CP are the two nutritional factors most likely to limit milk production and growth. The amount of TDN and CP offered to a particular animal was calculated from the quantity of a particular feed ingredient offered on Dry Matter (DM) basis. The requirements of energy (TDN) and protein (CP) of individual animal were calculated on the basis of their live weight and nutrient requirements for maintenance, growth, gestation and milk production, separately depending upon the physiological stage, as specified by Ranjan (1998) <sup>[11]</sup>. The energy and protein requirements of milch cattle and buffaloes were calculated based on their maintenance requirement and milk production with 6 percent fat. The data was subjected to statistical analysis to draw inferences. Correlation between the variables was computed as per Snedecor and Cochran (1994) <sup>[12]</sup>.

### Result and Discussion

Proximate composition and nutritive value of various feedstuffs fed to the lactating cattle and buffaloes by farmers of Jhajjar district of Haryana have been depicted in table 1. The average values of the feedstuffs were in accordance with Sen *et al.* (1977) <sup>[10]</sup> and Kumar (2019) <sup>[3]</sup>. Possible variations may be arisen due to difference in variety, processing techniques and amount of adulteration.

**Table 1:** Chemical composition (%) and nutritive value (%) of feedstuffs fed to cattle and buffaloes

Feed stuffs	DM%	CP%	EE%	CF%	NFE%	TDN%
Wheat straw	89.99 (88.24-92.20)	3.35 (2.88-3.80)	1.35 (0.14-1.55)	36.98 (34.60-38.78)	46.96 (44.00-50.15)	49.00
Kadbi	88.12 (86.56-90.04)	3.92 (3.20-4.35)	1.35 (1.10-1.36)	35.88 (33.16-38.56)	47.72 (42.13-51.45)	55.00
Berseem fodder	11.89 (10.20-14.50)	15.03 (12.20-18.20)	3.20 (2.84-3.55)	20.06 (18.60-22.00)	48.72 (46.48-52.14)	62.00
Oat fodder	19.54 (18.66-21.00)	9.55 (8.90-11.60)	3.04 (2.80-3.16)	31.05 (30.60-32.00)	53.93 (53.00-54.38)	52.00
Dalia	89.09 (87.50-91.20)	8.69 (7.90-9.80)	2.90 (1.93-4.02)	3.58 (2.34-4.40)	80.17 (78.00-82.01)	78.00
Gram churi	88.82 (86.14-91.90)	12.38 (10.50-14.20)	2.02 (1.81-2.33)	24.76 (23.66-26.74)	48.82 (44.60-52.00)	78.00
Cotton seed	88.31 (86.14-90.58)	19.19 (15.70-22.12)	15.77 (12.70-18.60)	24.77 (22.40-28.16)	36.93 (33.20-41.00)	88.00
Cotton seed cake	88.31 (86.50-90.40)	18.53 (15.40-23.00)	5.97 (4.88-8.20)	22.76 (21.06-24.00)	40.36 (36.20-46.44)	75.00
Mustard cake	88.80 (86.25-89.66)	27.89 (26.44-30.30)	6.05 (5.50-6.54)	22.66 (19.50-29.15)	43.89 (42.04-45.00)	78.00
Concentrate pellet	90.52 (88.80-92.00)	14.34 (13.60-14.70)	8.10 (7.00-9.00)	13.59 (11.80-14.90)	46.93 (45.90-48.00)	76.00

Comparative feeding plane of different feedstuffs in different blocks of Jhajjar district is described in table 2. Berseem was the commonly used green fodder used by 70% of farmers followed by oat fodder (56.11%) to fed as green fodder to their lactating cattle and buffaloes because berseem is a legume fodder having adequate crude protein content, multiple harvest crop by nature and yields more quantity per unit area as compared to other fodder. Green fodders were fed

in chopped form to the animals. Feeding of berseem was highest in Beri (100%) and lowest in Matenhel block (44.44%). Oat fodder was highly used in Matenhel block (72.22%) and lowest in Jhajjar (66.67%). In dry fodders, wheat straw was the preferred over all dry fodders and used in every block by most of the farmers (88.88%) followed by kadbi (40%). Wheat grain (dalia) was the common energy source fed by most of the farmers (94%).

**Table 2:** Comparative feeding plane of different feedstuffs in different blocks

Feedstuffs	Blocks				
	Bahadurgarh	Beri	Jhajjar	Salhawas	Matenhel
Oat fodder	18 (50.00%)	17 (47.22%)	16 (44.44%)	24 (66.67%)	26 (72.22%)
Berseem	32 (88.89%)	36 (100%)	24 (66.67%)	18 (50.00%)	16 (44.44%)
Wheat straw	34 (94.44%)	36 (100%)	32 (88.89%)	28 (77.78%)	30 (83.33%)
Kadbi	12 (33.33%)	10 (27.78%)	12 (33.33%)	18 (50.00%)	20 (55.56%)
Wheat grain	34 (94.44%)	33 (91.97%)	36 (100.00%)	34 (94.44%)	32 (88.89%)
Concentrate pellet	14 (38.89%)	12 (33.33%)	22 (61.11%)	26 (72.22%)	28 (77.78%)
Cotton seed	28 (77.78%)	32 (88.89%)	30 (83.33%)	26 (72.22%)	24 (66.67%)
Cotton seed cake	32 (88.89%)	30 (83.33%)	32 (88.89%)	30 (83.33%)	27 (75.00%)
Mustard cake	14 (38.89%)	11 (30.56%)	9 (25.00%)	15 (41.67%)	12 (33.33%)
Min. mixture	2 (5.56%)	6 (16.67%)	5 (13.89%)	4 (11.11%)	4 (11.11%)
Common Salt	24 (66.67%)	20 (55.56%)	21 (58.33%)	18 (50.00%)	22 (61.11%)

Concentrate pellet was the supplement source of energy and protein used by 56.66% farmers. It was maximum in Matenhel block (77.78%) and minimum in Beri (33.33%). Cotton seed and cotton seed cake were the main source of protein used by 77.77% and 83.33% of farmers. Cotton seed and cotton seed cake were highly used in Beri and Bahadurgarh block, valued as 88.89%, respectively. Mustard cake was used in much less in proportionate as compared to cotton seed cake, used by 33.88% farmers. It was used highest in Salhawas block (41.67%) and lowest in Jhajjar (25.00%). Concentrate was used two times a day in lactating animals at the time of milking for easy handling of animals during milking in soaked form. Mineral mixture was not used by farmers, a small proportion (11.6%) of farmers considered it in diet of animals during their pre and post parturient period. Common salt was used by 58.33% farmers in animal diet, used in same proportion in every block.

The average body weight of cattle in Jhajjar district was 387.82 kg, ranged from 345.00 kg to 425.00 kg and the milk yield ranged from 7.00 kg/day to 18.00 kg/day, averaged as 10.4 kg/day. The average daily dry matter (DM) intake was 9.45 kg/day, varied from 5.85 kg/day to 12.60 kg/day, comparing with the total DM required (10.66 kg/day), observed as 24 animals, comprising 26.67% animals were found to be underfed in respect of DM. The average daily crude protein (CP) fed to the cattle was 1.28 kg/day, ranged from 1.07 kg/day to 2.13 kg/day against the required amount as 1.42 kg/day, obtained that 36 animals, that is 40.00% animals were deficient in respect of CP intake. The total digestible nutrients (TDN) requirement for cattle was 7.32 kg/day and the amount of TDN fed to the cattle was 6.42 kg/day, comparing these two values, 22 animals comprising 24.44% of the animals were found to be deficient in respect of TDN (Table 3).

**Table 3:** Feeding plane and nutrient intake of cattle and buffaloes

Attributes	Cattle (N=90)	Buffalo (N=90)
Body weight of buffaloes (kg)	387.82 (345.00-425.00)	498±2.12 (450.00-548.00)
Milk yield (kg/day)	10.40±1.65 (7.00-18.00)	9.64±1.91 (6.00-16.00)
Total DM intake (kg/day)	9.45±1.31 (5.85-12.60)	12.54±1.30 (7.54-20.03)
Total DM required (kg/day)	10.66±0.93	13.72±0.56
Animal underfed in respect of DM	24 (26.67%)	25 (27.77%)
Total CP intake (kg/day)	1.28±0.79 (1.07-2.13)	1.23±0.24 (0.63-2.27)
Total CP required (kg/day)	1.42±0.09	1.45±0.02
Animals underfed in respect of CP	36 (40%)	38 (42.22%)
TDN (kg/day)	6.42±1.12 (5.67-10.66)	7.51±1.17 (4.61-11.63)
Total TDN required (kg/day)	7.32±0.23	7.65±0.19
Animals underfed in respect of TDN	22 (24.44%)	28 (31.11%)

The average body weight of buffaloes was 498.00 kg and the average daily milk yield of buffaloes was 9.64 kg/day. The total average daily DM intake of buffalo was 12.54 kg/day, comparing this to the total DM requirement (13.72 kg/day), found that 25 animals, comprising 27.77% proportion was underfed in respect of DM. the average CP intake of buffaloes was 1.23 kg/day, against its daily requirement of 1.45 kg/day, 38 animals (42.22%) were found to be deficient in CP. And TDN intake was 7.51 kg/day, comparing to the requirement (7.65 kg/day), 28 animals (31.11%) animals were found to be underfed in respect of TDN.

Average weight of buffaloes (498.00 kg) was higher than cattle (387.82 kg) but the average milk yield (9.64 kg/day) of buffaloes was less than the cattle (10.40 kg/day) due to high fat percentage in buffalo's milk. Intake and requirement of DM and TDN was higher in buffaloes as compared to cattle whereas intake of CP was higher in cattle than buffaloes but the CP requirement was higher in buffaloes.

The present studies revealed that the number of cattle and buffaloes deficit in protein were more than the DM and TDN. These findings were in consonance with findings of Maan (2000) [5], in Rohtak Ramsawroop (2019) [9] and Bhiwani district, Baloda (2016) [2] in Gurugram district and Kumar (2019) [3] in Jhajjar of Haryana. As Jhajjar, Rohtak, Bhiwani and Gurugram shares same geographical distribution and adopted same feeding practices for their dairy animals. The results were also in accordance with the studies conducted of Singh (1997) in Hisar district and also with the survey conducted by Singh (2002) in Mohindergarh district who reported that buffaloes were overfed with TDN and deficient CP. Nagalakshmi *et al.*, (2006) [6] and Ramesh *et al.*, (2006) [8] also reported mild to moderately excess TDN intake in

buffaloes in their study. Here, we found that 40% cattle and 42.22% buffaloes deficient in CP comparing to 26.67% and 27.77% DM deficient and 24.44% and 31.11% TDN deficient, respectively.

### Conclusions

In dry fodders, wheat straw was the preferred over all dry fodders and used in every block by most of the farmers (88.88%) followed by kadbi (40%). Wheat grain (dalia) was the common energy source fed by most of the farmers (94%). Concentrate pellet was the supplement source of energy and protein used by 56.66% farmers. Cotton seed and cotton seed cake were the main source of protein used by 77.77% and 83.33% of farmers.

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