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EFFECTS OF COMPACT FEED BLOCK ON QUANTITATIVE AND QUALITATIVE PERFORMANCE OF LACTATING BUFFALOES– AN ON-FARM TRIAL STUDY

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SUMMARY

An on-farm trial (OFT) was conducted on 15 lactating buffaloes maintained at farmers' field in the Sunargaon village of district Uttarkashi, Uttarakhand. The buffaloes were selected on the basis of similarity in age, body weight and milk yield. The buffaloes were randomly divided into three groups of five each. Control group (T_1) was fed as per farmers' practices (grazing+feeding of without chaffed hay of forest grass+1.0 kg of barnyard millet). Group T_2 was fed T_1+home made concentrate mixture (containing cereals-40%, cake 30%, cereals and other by-products 27%, mineral mixture 2% and iodized common salt 1%) @ 1.5 kg/buffalo/day for 90 days and T_3 was fed T_1+compact feed block (prepared by Uttarakhand Livestock Development Board, Dehradun) @ 4.0 kg/buffalo/day for 90 days. The proportion of roughage to concentrate in CFB was 70 : 30. The body weight of animals was calculated using Schaeffer's formula before and after the trial. The milk yield of individual animal was recorded daily in the morning and evening. Milk samples were drawn fortnightly and analyzed for milk fat. Final milk yield was higher in group T_3 (6.06 l/day) followed by T_2 (5.40 l/day) over the T_1 (3.48 l/day). There was higher lactometer reading in group T_3 (31.3) followed by T_2 (30.5) than in group T_1 (28.3). Average fat content was higher in group T_3 (7.30%) followed by T_2 (7.11%) than in group T_1 (6.95%). It was concluded that feeding of compact feed block improved milk yield and fat percentage in lactating buffaloes.

Key words : Compact feed block, lactating buffaloes, milk yield and fat per cent

The shortage of protein and energy feed ingredients and economic considerations have attracted the attention of animal nutritionists to use unconventional feed resources in the feeding schedule of livestock. Feed blocks are a solidified mixture of agro-industrial by-products used for supplementing poor quality roughages and native rangelands. They are considered as a catalyst supplement, allowing a fractionated, synchronized and balanced supply of the main nutrients (i. e. energy, nitrogen, minerals and vitamins) for animals. The growth and health of growing dairy animals affect the productivity and reproductive efficiency in whole life. The feed and water intake in dairy animals is influenced by several factors such as body weight, age, sex, climate, feeding pattern, physiological form fraction, level of production, health and other managerial practices (Kumar *et al.*, 2014). Feed block technology is simple and does not require sophisticated equipment. Blocks are easy to handle, transport and can be made at the farm levels using the family labour. Different formulae can be manufactured with different levels of urea, binders and a wide range of agro-industrial by-products, which are available locally.

Compressed compact feed block (CCFB) technology provides opportunity for the incorporation of deficient nutrients, use of unconventional and agro-industrial by-products for optimum livestock production and also provides cheaper transportation cost of bulky materials from surplus to scarcity areas. Increased dry matter intake in the buffaloes fed with compact feed block as compared to conventional method of feeding was reported by Lailer *et al.* (2010). Dwivedi *et al.* (2003) also reported increased dry matter intake from dry roughages in the form of compact feed block than conventional method of feeding. Compact feed system ensures not only better utilization of nutrients from crop residues but also supplies balanced nutrients, controls ratio of roughage to concentrate, provides uniform feed intake, reduces feed wastage, enhances nitrogen balance and milk production (Raut *et al.*, 2002). Feeding of

compact feed block increases the feed intake and nutrient utilization needed for synthesis of body tissues (Owen, 1979) and results in more stable and ideal environment for rumen fermentations, which in turn, can boost and economize the performance of buffaloes (Wadhwa and Bakshi, 2006). Feeding of compact feed block has resulted in earlier attainment of maturity of animals; this not only lowers the cost of rearing, but also reduces age at first calving. It also provides regularity to subsequent calving and increases life time production. The optimum supply of nutrients including micronutrients as a positive effect on health, keeps the animal free from many reproductive problems e. g. late maturity, anoestrus and repeat breeding. Block feeding provides immune protection against infectious diseases resulting in significant saving in cost of medicating animals. Therefore, in the present on-farm trial, effect of feeding compact feed blocks made by Uttarakhand Livestock Development Board (ULDB), Kalsi, Dehradun on milk yield, milk fat percentage and lactometer reading was studied in the Sunargaon village of district Uttarkashi, Uttarakhand.

MATERIALS AND METHODS

The on-farm trial (OFT) was conducted at the village Sunargaon of district Uttarkashi in Uttarakhand. Total area of Uttarkashi district is 8016 Sq. km distributed into six development talukas, having 677 revenue villages. The district is having annual rainfall of 1270 mm with latitude of 30.73° N and longitude 78.45° E. Atmospheric temperature ranges from -20 to 35°C during different seasons. There is a positive trend in rearing of lactating buffaloes in the district. For conducting OFT, 15 non-descript lactating buffaloes in the first lactation were randomly selected and divided into three groups of five each on the basis of body size, age, milk yield and period of calving. Buffaloes in control group were fed as per farmer's practices (grazing+*ad lib* feeding off without chaffed hay of forest grass+1.0 kg grain of barnyard millet). Buffaloes in 2nd group were fed T_1+homemade concentrate mixture (contained cereals 40%, cake 30%, cereals and other by-products 27%, mineral mixture 2% and iodized common salt 1%) @ 1.5 kg/buffalo/day for 90 days and buffaloes in 3rd group were fed T_1+compact feed block (prepared by Uttarakhand Livestock Development Board, Dehradun) @ 4.0 kg/buffalo/day for 90 days. The proportion of roughage to concentrate in CFB was 70 : 30. The fresh drinking water was freely available to all the animals. All 15 buffaloes were treated with anthelmintics before the start of study and repeated at three months interval. All the buffaloes were milked twice daily at 5.30 AM and 5.30 PM. Daily milk yield of each animal was recorded throughout the experimental feeding period. The morning and evening milk samples of individual animals were collected at fortnightly intervals and were pooled for fat analysis. Fat content was estimated as per Gupta *et al*. (1992).The data were analyzed statistically by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

Physical and chemical composition of concentrate mixture and compact feed block used in the present experiment are given in Table 1. Physical composition of feed block showed that various straws were used for preparation of that, it means more and more nutrients are available in blocks. Organic matter, crude protein, ether extract and NFE were higher in concentrate mixture, which were given to the animals in treatment 2, however, higher crude fiber percentage was reported in feed blocks, which was given to the animals in treatment 3. Daily milk yield, lactometer reading and milk fat percentage of all three treatments are given in Table 2 and Fig. 1 and economics are given in Table 3 and Fig. 2. Akter *et al.*

TABLE 1
Physical and chemical composition of compact feed block

Attributes	Homemade concentrate mixture (Wt. in kg/100 kg)	Compact feed block (Wt. in kg/28 kg)
Physical composition		
Wheat straw	-	15.60
Other pulses straw	-	4.00
Crushed wheat	40.00	3.00
Mustard cake	30.00	1.00
Wheat bran	13.50	1.30
Dal chunni	13.50	-
Mineral mix	2.00	0.50
Iodized salt	1.00	0.20
Urea		0.20
Molasses		2.20
Chemical composition (% dry matter basis)		
Organic matter	90.40	88.40
Crude protein	16.72	7.77
Ether extract	6.30	2.95
Crude fiber	12.70	26.50
NFE	54.68	51.18

TABLE 2
Performance of lactating buffaloes in different groups

Treatment	Average milk yield (l/day)	Lactometer reading	Milk fat content (%)
T_1 (Control)	3.48±0.08	28.3±0.45	6.65±0.12
T_2	5.40±0.14	30.5±0.32	7.01±0.02
T_3	6.86±0.09	31.3±0.22	7.20±0.03

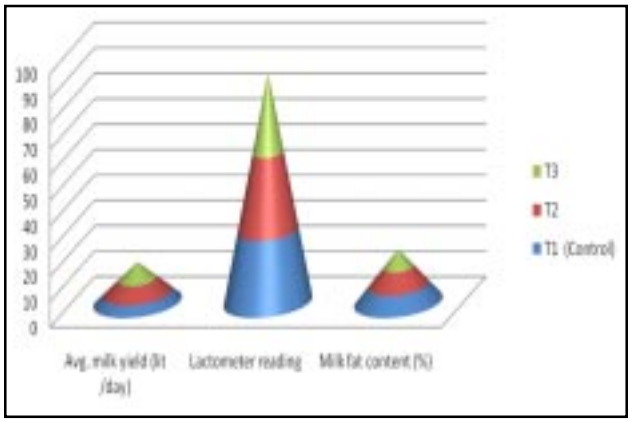

Fig. 1. Performance of lactating buffaloes in different groups.

(2004) conducted a trial to show the effect of feeding multinutrient block on milk yield and composition of cow and reported higher milk yield and fat per cent of cow milk feeding with compact feed block than control. Buragohain and Kalita (2014) conducted a study to assess nutritional status of lactating dairy cattle in Mizoram and the average milk production (kg/cow/day) was recorded as 7.2, 7.6 and 7.4 kg, respectively, in Bawngkawn, Durtlang and Shiphir areas of Mizoram. Milk fat analysis of randomly collected milk samples revealed 6.1, 6.2 and 5.8 per cent milk fat in Bawngkawn, Durtlang and Shiphir areas, respectively. Talpada *et al.* (2001) reported significantly ($P<0.05$) higher average milk yield in cows fed with compact feed than in cows fed on conventional feed which is in contrast to the present study. Results of on-farm feeding trial with feed block conducted on buffaloes in rural areas around Karnal showed a significant increase in milk production (10-15%) compared with normal feeding practices by farmers in the villages. Although feed cost increased by 30 per cent with block feeding, the profit earned was approximately 20 per cent higher (Senani *et al.*, 2013).

TABLE 3
Economics of different groups

Treatment	Extra expenditure/day as per control (Rs.)	Extra income/day as per control (Rs.)	Net income/day	Total extra income during trial/animal	C : B ratio
T_1 (Control)	-	-	-	-	
T_2	18.00	57.60	39.60	3564	1 : 2.2
T_3	25.71	101.40	75.69	6812	1 : 2.94

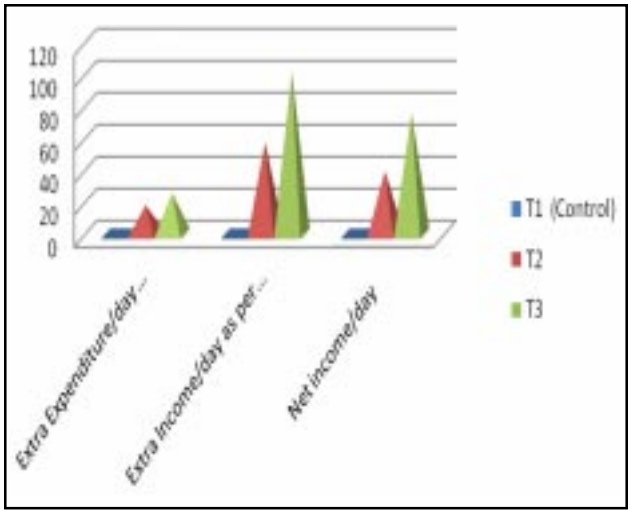

Fig. 2. Economics of different groups.

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