

Replacement of concentrate mixture by berseem forage (*Trifolium alexandrium*) in cross-bred cows

VIJAY SINGH, RAMJI GUPTA AND P. K. UPADHYAY

ABSTRACT

Twelve lactating cross-bred cows were randomly divided into three groups having four animals in each on the basis of body weight and were allotted three dietary treatments. The animals under control group (Group I) were fed according to ICAR feeding standard. The cross-bred cows of II group were fed green berseem fodder ad-libitum along with 5 kg wheat-straw. The cross-bred cows of group III were fed wheat straw and the calculated amount of concentrate mixture, mineral mixture and common salt were also offered to each group of experimental animals. The cows of II group consumed significantly ($P < 0.01$) more DM, DCP, TDN, followed by I and III group of treatment. Higher significant ($P < 0.01$) milk yield was recorded in II groups as compared to T_I and T_{III} groups. However, there was no significant difference found in milk yield of T_I and T_{II} group. It can be concluded that feeding of green berseem (*Trifolium alexandrium*) to the milch animals is good as compared to control feeding. Because the feeding cost of cross-bred cows are very low in the green berseem fed group as well as has no adverse effect on the milk production in cross-bred cows.

KEY WORDS : Berseem forage, Cross bred cow, Concentrate mixture, Wheat straw

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INTRODUCTION

Today's livestock farming has been adversely affected due to increasing price of different types of feed and fodder such as hay, silage, green jowar, Bhusa etc. So, the live stock farmers use conventional feed such as tree leaves and different type of wood, grass etc. Two nutritional factors that are most commonly associated with limited milk production and proper growth are energy and protein. To ensure maximum intake of feed after calving to attain the highest milk production, the ration should contain high energy but must contain adequate fiber to assure proper rumen functioning. The total green fodder requirement for livestock is 913.69 mt. but the total availability of fodder in India is 613.37 mt. So, 296.32 mt green fodder are lack the total dry fodder requirement is 588.19 mt and total availability of dry fodder is 536.85 mt. so 21.34 mt dry fodder are deficit in India as per required,

resulting a great short fall of fodder availability for animal than the requirement (Dept. of Animal Husbandry, U.P. Govt. 2005). The profit from dairying is governed by the cost of milk production and its sale price in the market Feed cost is the major component accounting for 70-75 per cent of total cost of milk production. Berseem is one of the most important green fodders of *Rabi* season. It is grown extensively throughout the country. It is generally fed as green fodder. It could also be fed as hay and mixed with dry forage. Livestock could be maintained throughout the *Rabi* season on green fodder. There is important in milk yield when the cows are switched on this fodder from other ration. Some studies on this aspect have been carried out on cattle in our country. However, information in this regard to cow is limited.

MATERIALS AND METHODS

The study was conducted on twelve lactating cross-bred cows during January to February 2007 for 60 days to asses the replacement of concentrate mixture by berseem forage (*Trifolium alexandrium* L.) in cross bred cows. The animals were divided into three groups and 4 animals in each on the basis of their body weight and milk yield and were subjected to the following dietary

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treatment. Group I was fed according to ICAR feeding schedule and served as control group, group II was fed berseem forage ad-lib with 5 kg wheat straw and group III was fed wheat straw + concentrate mixture. The animals were housed in well ventilated sheds which were washed and cleaned daily. The animals were maintained in experimental sheds with arrangement for individual feeding and watering. Proper attention was paid to cleanliness and other related by generic condition. The cross-bred cows were dewarmed and vaccinated against foot and mouth disease, black quarter and haemorrhagic septicaemia disease.

Metabolism trial and collection of samples:

A metabolism trial of 7 days duration was conducted after the feeding trial to determine the digestibility coefficient of dry matter, crude protein, ether extract, crude fiber, nitrogen free extract and organic matter. The animals were transferred to metabolic cages for 10 days before the commencement of actual trial to acclimatize them in the situation. The faeces, urine and residues were discarded two days before the actual collection period. During this period, faeces and urine, were collected separately and carefully weighed after twenty four hours. Each sample was taken, mixed thoroughly and small amount was taken at random from the different portions of the bulk in wide mouthed glass stopper bottle and taken to the laboratory and suitable aliquot was weighed for analysis. The chemical analysis were done according to AOAC (1980).

RESULTS AND DISCUSSION

The chemical composition of green berseem, wheat straw and concentrate mixture are presented Table 1. The variation in chemical composition of concentrate mixture in different proportion deliberately was due to meet the nutritional requirement of the cattle on two dietary regimes. The DM, CP, CF, EE and NFE, berseem was reported by Rajagopal and Murty (1983).

Table1: Proximate composition (% DM basis) of concentrate mixture and fodder offered to crossbred cows

Attributes	Green berseem	Concentrate mixture	Wheat straw	Digestibility %
DM	15.00	90.00	90.00	65.67±1.24
CP	17.50	20.00	3.00	67.90±1.27
EE	2.25	1.00	1.00	63.68±1.53
CF	24.00	15.60	38.00	64.52±0.62
NFE	46.00	51.10	46.00	69.62±0.77
Total ash	10.25	11.50	12.00	-

Nutrient intake:

Dry matter consumption per day per animal was 9447.75±246.18, 9693.75±71.78 and 7744.5±67.94 g/day in group I, II and III respectively. There were significant difference observed in dry matter consumption, dry matter intake per 100 kg body weight and per kg metabolic body size were significantly higher (P<0.01) in experimental group. Significantly higher (P<0.01) D.C.P. and T.D.N. intake were observed in T II, T I and T III group.

The dry matter consumption per 100 kg body weight. was observed 2396±69.79, 2460±8.44 and 1960±21.74 g in I, II and III, respectively. There was significant difference of DM consumption per 100 kg body weight similar observation was recorded by Pauchuri and Negi (1978).

The intake of DCP were found in 912.60±53.76, 1043.90±12.56 and 553.72±63.95 g/day in group I, II and III respectively. The higher consumption of DCP and better utilization of CP were in group II as compared 1 and II of cross bred cows. There were significant results reported by Sahoo *et al.* (2001). The daily TDN intake varied from 5321.50±195.22, 5366.25±43.08 and 4203.75±129.63 g/day in group I, II and III, respectively. The higher consumption of TDN in II as compared to I and III group of crossbred cows. There were significant differences recorded in TDN among the group. Adel-Hassan and Soliman (1977) reported similar result in cross-bred cows. The digestibility coefficient of dry matter was found 58.52±0.61, 65.67±1.24 and 52.87± 1.05 per cent in group I, II and III, respectively. Significant higher (P<0.01) dry matter digestibility were observed in II, I and III group as also reported by Girdhar and Balaraman (2004). Digestibility coefficient of crude protein was 64.40±0.53, 67.90±1.27 and 62.05±0.77 per cent in group I, II and III respectively. Significantly higher crude protein digestibility were observed in group II as compared to group I and II. Similar observations have been reported by Sahoo *et al.* (2001). The digestibility coefficient of ether extract in group II and III were found 66.00±1.70, 68.0±1.04 and 63.68±1.53, respectively. Statistical analysis of. data were found higher significant difference in EE digestibility among the group of experimental animals. Numerically slightly higher ether extract digestibility was found in group II as compared to I and III group. Similar observations were reported by Sahoo *et al.* (2001).

Digestibility coefficient of crude fibre was found 57.93±0.99, 64.52±0.62 and 52.54±1.19, in group I, II and III, respectively. There was significant differences (P<.01) observed in crude fibre digestibility among groups of treatment cross bred cows. Critical analysis of data

Table 2: Showing the average values at different proximate principles and loss of milk production

Sr. No.	Particulars	T ₁	T ₂	T ₃
1.	Dry matter intake (g) DMI	9447.50±246.18	9693.75±71.78	7744.50±67.94
2.	Metabolic body size (kg)	88.47±0.50	88.42±0.57	88.57±0.25
3.	Dry matter intake/100 body wt. (g)	2396±69.79	2460±0.33	1960.75±21.74
4.	Dry matter intake gm/kg metabolic body wt.	106.95±2.99	109.5±0.33	87.40±0.89
5.	DCP intake (g)	593.49±47.04	649.21±8.97	343.35±69.34
6.	TDN intake (g)	5321.50±195.22	5366.25±43.88	4203.75±129.63
Nutrient digestibility				
1.	Dry matter (%)	58.52±0.61	65.67±1.24	52.84±1.05
2.	Crude protein (%)	64.40±7.70	68.01±1.27	62.75±.77
3.	Ether extract (%)	66.00±7.70	68.01±1.04	63.68±1.53
4.	Crude fiber (%)	57.93±0.99	64.52±0.62	52.54±1.19
5.	Nitrogen free extract (%)	69.25±0.71	69.62±0.77	63.11±1.46
6.	Organic matter (%)	66.76±1.23	67.92±0.82	61.85±0.96
7.	Nitrogen balance	32.49±1.76	39.11±1.98	11.69±1.64
8.	Loss of milk production (ml/day)	7.91±2.84	9.58±2.84	16.66±3.04

exhibited that crude fibre digestibility were found significant by Girdhar Balaraman (2004). The digestibility of nitrogen free extract for I, II and III were found 69.25±0.712, 69.62±0.73 and 63.11±1.46, respectively. Higher nitrogen free extract digestibility was reported group II compared to group I and group III. Similar observations were reported by Girdhar and Balaraman (2004). The role of average daily loss in milk production during 60 days of milk production trial was 7.91±2.84; 9.58±2.84, 16.66±3.4 ml in group I, II and III, respectively. The higher loss of milk yield was found in group III, group II and group I of cows. Similar results were found by Mudgal *et al.* (1986), Garedavila and Olson (1978). The feed cost per animal for 60 days feeding was Rs. 2300.40 of the control group, Rs. 1788.50 of the treatment group 1963.85 of the experimental group I crossbred cows. Feed cost was lower in treatment group as compared experiment group and control (Reddy *et al.* 1994).

Conclusion:

It can be concluded that feeding of green berseem (*Trifolium alexandrium* L.) to the milk production is good as compared to control feeding. Because the feeding cost was very low in green feed group, as well as has no ill effect on the milk production in cross bred cows.

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