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Impact of bypass protein & mineral mixture feeding on milk fat % and SNF % of crossbreed cattle

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Abstract

The present study was planned to evaluate the effect of bypass protein and mineral mixture feeding on production and economic parameters of Crossbreed cattle. An On Field Trial was conducted during 2016-17, 2017-18 and 2018-19, by KVK Hanumangarh. Total 10 Lactating crossbred cows from 10 different farmer herd, with average milk yield of 10.9 kg were selected. Each animal was first treated with T1 (Mineral Mixture @50 gm/ animal/day) for 30 days and then treated with T2 (Mineral mixture @ 50g/Animal/day with Bypass protein) for 30 days. The average milk production (litres), average fat percentage and average SNF percentage on feeding mineral mixture with bypass protein improved as compared to supplementing bypass protein without mineral mixture. Also, average fat percentage was 3.79% and 4.59% on feeding mineral mixture and mineral mixture with bypass protein, respectively. Similar to fat %, average SNF % increased from 8.11% to 8.69% on feeding mineral mixture and mineral mixture with bypass protein, respectively. Also, the net profit and benefit cost ratio on feeding mineral mixture with bypass protein was also higher than feeding mineral mixture only. Sell at price of milk also increased from Rs 19.8 to 27 per litre because change in Fat% and SNF%. Thus, it can be concluded that bypass protein with mineral mixture improves production performance of crossbreed cattle and also improves economy of farmer.

Keywords: Bypass protein, mineral mixture, Fat%, SNF%, sell price

Introduction

India ranks 1st in milk production, which is due to highest number of cattle & buffalo in world (BAHS, 2019) [2]. Dairy farmers of Hanumangarh keep large number of animal, however, the milk production of these animals is quite low. A large number of farmers are rearing 2- 5 dairy animals at their farm. Most of farmers are rearing HF crossbreed cow. They consume a part of milk produced at home and rest of milk is sold to milk collection centre (cooperative and private), which play important role in small savings/ daily expenses of farmer family. Farmers usually feed easily available concentrate feed in market which doesn't have bypass protein, resulting protein is fed by concentrate feed is degraded in rumen (Straalen and Tamminga, 1990) [7]. Crude protein in seeds (grains, oil seeds, pulses) is mainly true protein and can be present in the husk, the pericarp or the seed itself. In husk and pericarp structural protein dominates, whereas in the seed the vast majority of protein (80-90%) is storage protein in the aleuron layer and in the endosperm (Ensminger and Olentine, 1978) [3]. Proteins used in animal nutrition can be classified according to their solubility in water (albumins), a salt solution (globulins), alcohol (prolamines) or dilute alkali (glutelins) or on the basis of their function in the plant (enzymes, structural protein, storage protein). Nitrogen in fresh forages is 70-90% true protein and 10-30% non protein nitrogen (Tamminga, 1986) [6].

Anaerobic protein degradation in the rumen contains two steps, being hydrolysis of the peptide bond by proteases and peptidases and decarboxylation and/or deamination of amino acids. The first step results in peptides and amino acids, and end products of the second step are volatile and branched chain fatty acids (VFA's and BCFA's), CO₂, and NH₃. In the rumen deamination is the most important degradative pathway of amino acid degradation (Baldwin and Allison, 1983) [1].

Therefore, the present study was planned to study the effect of bypass protein and mineral mixture feeding on production and economic parameters of Crossbreed cattle.

Methodology

An On Field Trial was conducted during 2016-17, 2017-18 and 2018-19, by KVK

Hanumangarh. Total 10 Lactating crossbred cows from 10 different farmer herd, with average milk yield of 10.9 kg were selected. Each animal was first treated with T1 (Mineral Mixture @50 gm/ animal/day) for 30 days and then treated with T2 (Mineral mixture @ 50g/Animal/day with Bypass protein) for 30 days. Under this trial, 116.7 kg bypass protein feed and 6kg mineral mixture was provided to each Animal for 30days each. The control animals(T1) fed green maize fodder with wheat straw as roughage source and concentrate mixture (consisting of maize, 29; barley, 5; GN cake, 20; mustard cake, 12; wheat bran, 20; deoiled rice bran, 11; mineral mixture, 2; salt, 1 part), as per requirement (NRC 2001) [5] whereas experimental group (T2) fed T1 plus bypass protein feed (SARAS product). The animals were kept in well-ventilated Animal shed with access to fresh water and having separate mangers for fodder and concentrate. The animals were milked twice a day at morning, and in evening and the concentrate was given at each milking time. Bypass protein was fed uniformly in morning individually to each animal. Milk samples from each animal in both groups were collected and analysed at weekly intervals for milk composition. During the whole trial period, the milk samples were collected and pooled in a container from all individual

animals and analysed for milk fat% and solids-not-fat% (ISI 1961) [4].

Results and Discussion

The Milk production, milk fat% and milk SNF% of the lactating cross bred cows fed diets supplemented with bypass protein is given in Table 1. The average milk production (litres) on feeding mineral mixture without bypass protein was 10.93 litres which was increased to 13.18 litres on supplementing bypass protein with mineral mixture. Also, average fat percentage was 3.79% and 4.59% on feeding mineral mixture and mineral mixture with bypass protein, respectively. Similar to fat %, average SNF % increased from 8.11% to 8.69% on feeding mineral mixture and mineral mixture with bypass protein, respectively.

The cost of feeding T1 and T2 was Rs. 82 and Rs. 123.3 per animal per day. The gross cost of milk for t1 and T2 was Rs. 216.4 and Rs. 350.6 per animal per day. Thus, the net profit on feeding mineral mixture and mineral mixture with bypass protein was Rs. 134.4 and Rs. 225.91, respectively. The benefit cost ratio also improved from 2.64 to 2.84. Sell at price of milk also increased from Rs 19.8 to 27 per litre because change in Fat% and SNF%.

Table 1: Effect of bypass protein and mineral mixture feeding on production and economics of Crossbred cattle

Parameters	T1 (Mineral Mixture @50 gm/ animal/day)	T2 (Mineral mixture @ 50g/Animal/day with Bypass protein feed)
Avg. Milk Prod.(lit.)	10.93	13.18
Avg. fat%	3.79	4.59
Avg. SNF%	8.11	8.69
Cost of feeding (Rs./Ani./day)	82	123.3
Gross cost of Milk (Rs./Ani./day)	216.4	350.6
Net profit (Rs.)	134.4	225.91
B:C Ratio	2.64	2.84
Avg. Sale price of milk (Rs/litre)	19.8	26.6

Conclusion

The results of following experiment reveals that feeding of bypass protein feed improve milk production, Fat%, And SNF% which directly affect milk sell price at milk collection centres, thereby increasing overall profit of dairy farmers.

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