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Effect of different feed supplements on economics of milk production in lactating crossbred cows

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Abstract
The experiment was carried out on fifteen lactating cross-bred cows (Tharparkar/Sahiwal x HF) to study the effect of different feed supplements on economics of milk production at dairy farm of S.K.N. College of Agriculture, Jobner (Rajasthan). The animals were subjected to three dietary supplements i.e., concentrate mixture (T_1), concentrate mixture + UMMB (T_2) and concentrate mixture + Azolla (T_3). The average milk production (litre/cow) during study period was significantly higher ($P<0.05$) in T_2 (7.54) as compared to T_3 (7.27) and T_1 (7.13). Highest B:C was found in T_2 group (3.01) compared to T_3 group (1.82) considering only the benefits of milk production. The average daily feed cost per L milk production was Rs. 26.29, Rs. 25.23 and Rs. 26.06 in T_1, T_2 and T_3 groups, respectively. The supplementation of UMMB was more beneficial as compared to other groups.

Keywords: Azolla, milk production, economics, supplements, urea molasses mineral block (UMMB)

Introduction
Dairy is the single largest agricultural sector contributing 5 per cent of the national economy and employing more than 8 crore farmers directly. India is ranked 1st in milk production contributing 23 per cent of global milk production with annual growth rate of about 6.2 per cent. The productivity of dairy animals is greatly constrained by the lack of green fodder and good quality feed during prolonged dry season (Misra *et al.*, 2005) [6]. Feeding is one of the most important determinants of profit in the dairy farming. The cost analysis indicates the feeds alone constitute a major item of expenditure and accounts over 60-70 per cent of the total cost (Shahi *et al.*, 2010) [7]. The cost of conventional protein supplements is escalating with availability dwindling and there appears to be an impending need to evolve an appropriate alternative for ruminant feeding. The UMMB lick allows the slow ingestion of urea which in turn is efficiently utilized by the rumen microbe. Several experiments concludes that supplementation of UMMB licks significantly increase feed intake and milk yield of the cows (Kayastha *et al.*, 2012) [3]. Azolla (*Azolla pinnata*), an aquatic floating fern can make a suitable option because of its high nutritive value (Indira *et al.*, 2009) [2]. The shortage of fodder is compensated with commercial cattle feed, resulting in increased cost in milk production. Keeping this in view, the present study was planned to study the effect of different feed supplements on economics of milk production in lactating crossbred cows.

Materials and Methods
1. Feeding Management of Expeimental Animals
The experiment was conducted at dairy farm of LPM department, SKN College of Agriculture, Jobner. Fifteen lactating crossbred (Tharparkar/Sahiwal x Holstein Friesian) cows in early stage of lactation were selected based on body weight and milk yield and randomly divided into three groups. They dietary treatments were formulated and offered to each group of animals randomly for 90 days (Table 1). The animals were dewormed with anthelmintic before the start of experiment and were kept individually during experimental period in cattle shed. All cows were fed wheat straw (*Triticum aestivum*) ad lib. as dry fodder and concentrate mixture as per ICAR, (2013). The animal had free access to clean and fresh drinking water. The milk yield was recorded daily in the morning and evening. The feeding schedule of cows is given in Table 2.

Table 1: Detail of experimental treatments.

Symbols	Treatments
T_1	Wheat straw *ad lib.* + concentrate mixture
T_2	T_1+ UMMB (Urea Molasses mineral bricks) @ 300g/head/day by licking
T_3	T_1 + Azolla @1.5 kg/d/animals

Table 2: Feeding schedule of crossbred cows during experiment.

S. No.	Feed and fodders	Quantity of feed and fodders
1	Wheat straw	9.0 kg offered and fed *ad lib.*
2	Concentrate mixture	2.0 kg for maintenance ration/animal and @1kg/2.5 litre milk yield for production ration
3	UMMB	300 g UMMB cow/day by licking
4	Azolla	1.5 kg Azolla/animal/day was offered

2. Cost–Benefit Analysis

Partial budget analysis of feed supplements was done after completion of the experiment considering the prevailing costs of inputs and outputs from the milk (Stemmer *et al.*, 1998) [10]. Net returns and benefit–cost ratio was calculated to assess the economic feasibility of supplements. During partial budget analysis, only cost of supplements and returns from milk were considered since all other variables were considered the same for other groups (Bipate and Misra 2020) [1].

Results and Discussion

Feed cost of milk production

The economic evaluations of feeding the experimental ration and the feed cost per litre milk production was presented in Table 3. Average daily feed cost per animal was Rs.187.5, Rs.191.49 and Rs. 189.49 in T_1, T_2 and T_3, respectively. Average gross return from sale of milk per animal was Rs. 285.2, Rs. 301.2 and Rs. 290.8 in T_1, T_2 and T_3 groups, respectively. Average daily feed cost per L milk production was Rs. 26.29, Rs. 25.23 and Rs. 26.06 in T_1, T_2 and T_3, respectively. The feed cost per litre milk production was higher in group T_1 as compared to other treatments in crossbred cows. The higher gross return from T_2 and T_3 as compared to T_1 treatments due to more milk production and lower feed cost as compared to other groups. Net return over control was found higher in T_2 group followed by T_3 group and Benefit–cost ratio (B:C) also found higher in T_2 group 3.01 as compared to T_3 group (1.82). T_2 groups are more economical as compared to T_1 and T_3 group but Azolla feeding was less beneficial in respect to economic but nutritionally good for health of animals. Our results were supported by the results of other workers who also revealed an increment in milk yield and B:C ratio due to supplementation of UMMB reported by Bipate and Misra, (2020) [1] under field condition in Muzaffarnagar and Shamli districts of Utter Pradesh. The observed results confirm the earlier findings that indicated an extra yield of 0.5-1.5 kg milk and/ or saving of 20-30% concentrate with a reduction of feed wastage of 20-30% (Singh and Prasad 2002) [8]. Another on-farm experiment conducted in Uttaranchal, India indicated that the addition of blocks to the diet increased milk production by about 37% in buffaloes and 34% in local cows, without any adverse effect on the body weight and health of the animals (Singh and Singh 2003; Meel *et al.*, 2015) [9, 5]. Leng *et al.* (1991) [4] compared the results of conventionally fed animals with those fed UMMB and by-pass protein along with decreasing quantities of concentrate; showed that after reducing the amount of concentrate by 40%, feeding of UMMB and by-pass protein maintained the milk yield and increased the farmers net income. The improvement in milk yield may be explained that the energy: protein ratio may be balanced in the ration supplemented with UMMB.

Table 3: Effect of UMMB and Azolla supplementation on economics of milk (90 days).

Particulars (kg /cow/day)	Control (T_1)	UMMB (T_2)	Azolla (T_3)
Total quantity of wheat straw	9	9	9
Total quantity of concentrate	6	6	6
Quantity of supplementations	-	0.3	1.5
Feed cost (Rs. /cow/day)			
Wheat straw*	45.00	45.0	45.0
Concentrate**	142.50	142.50	142.50
Cost of supplementations***	-	3.99	2.00
Average daily feed cost per animal	187.5	191.49	189.49
Average daily milk yield L/cow/day****	7.13	7.53	7.27
Gross return from sale of milk L/cow/day	285.2	301.2	290.8
Average daily feed cost / L milk production	26.29	25.43	26.06
Net return	97.7	109.71	101.31
Net return over control	-	12.01	3.61
Benefit–cost ratio (B:C)	-	3.01	1.82

*Cost of wheat straw Rs.5/kg.
**Concentrate palleted Rs. 23.75/kg.
***Cost of UMMB bricks Rs. 40/3kg brick and Azolla Rs.1.33 /kg.
****The milk cost sold Rs. 40/L.

Conclusion

Therefore, it can be concluded that the supplementation of UMMB (T_2) increased the milk production in crossbred cows and feed cost per litre milk production was minimum. Thus, the inclusion of UMMB as supplement to dairy animals need to be encouraged.

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References

1. Bipate M, Mishra AK. Effect of urea molasses mineral block supplementation on milk production in Murrah buffalo under small holder's production system. Indian J Anim. Nutr. 2020;37(4):307- 313.
2. Indira D, Sarjan Rao K, Suresh J, Venugopal Naidu K, Ravi V. Azolla (*Azolla pinnata*) as feed supplement in buffalo calves on growth performance. Indian J Anim. Nutr. 2009;26(4):354-348.
3. Kayastha TB, Dutta S, Roy RK. Impact of supplementation of UMMB licks in the ration of dairy animals. Vetscan. 2012;7(1):107-110.
4. Leng RA, Preston TR, Sancoucy R, Kunju PJG. Multi-nutrient block as a strategic supplement for ruminants. World Animal Review. 1991;67(1):11-19
5. Meel S, Sharma V, Sharma S, Kaushik P. Effect of feeding urea mineral molasses block on milk production traits and economics in Jersey crossbred cows. Intern. J Sci. Res. 2015;4(2):368-369.
6. Misra AK, Maruthi V, Subrhmanyam KV, Babu MVS, Reddy TY, Shivarudrappa B *et al*. Impact of adoption of improved forage production on livelihood of farmers in semi-arid India. Souvenir-cum-Abstracts of National Symposium on "Augmenting forage resources in arid and semi-arid region: Long term strategies". RMSI and IGFRI, Jhansi, India, 2005, 48-50.
7. Shahi SK, Singh PK, Goyal RK. Nutritional status of goats in relation to gender variance of their ownership in eastern Utter Pradesh. Indian J Anim Pro. Mgmt. 2010;26(3-4):216-219.
8. Singh K, Prasad CS. Potential of nutritional technologies in improving livestock productivity. Technology Options for Sustainable Livestock Production in India. Proceedings of the workshop on Documentation, Adoption and Impact of Livestock Technologies in India. (Eds). Birthal P and Parthasarthy Rao P. ICRISAT-Patancheru, India, 2002, 132-146.
9. Singh PR, Singh M. Effect of UMMB supplementation on milk production in buffaloes and cows: an on-farm trial. Indian J Anim. Nutr. 2003;20(10):1-5.
10. Stemmer A, Peter Horst, Annovalle-Zarate. Analysis of eco-nomic variability of specialized milk production with dual purpose goats in small holder management systems. Anim. Res. Develop. 1998;47:44-52.