

Short Communication

Economics of Protein Protection and Feed Replacement in Sheep

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The rising cost and increasing scarcity of livestock feeds necessitated a scientific probe on utilization of non-conventional feeds on the one hand and use of by-pass technology on the other to maximize availability and utilization of nutrients for maximum profitability. Therefore, an attempt was made to economize the ration of desert sheep by replacement of high-priced cotton seed cake (CSC) and wheat bran by economical substitutes like de-oiled mustard cake (DMC), formaldehyde (HCHO)-treated and de-oiled mustard cake, and bakery waste. Mustard cake protein is highly degradable in rumen (Sampath 1987, 1990). Treatment with 1% HCHO has been reported to be safe, effective and economical in protecting dietary proteins from excessive ruminal fermentation (Coetzee, 1970), and thereby resulting in improvement of growth, daily weight gain and feed conversion efficiency in sheep (Mathur and Mathur 1989, Ganai 1996).

Sixteen male uncastrated and sheared Nali lamb of 7 to 8 months of age with uniform body weight and conformation were divided into 4 groups of 4 animals each

by completely randomized design. Air-dried feed samples were analyzed for proximate principles (AOAC, 1990), and on the basis of analysis four experimental rations were compounded so as to provide isonitrogenous and isocaloric status, keeping in view the nutrient requirements of growing lambs (Banerjee, 1988). For effective protein protection DMC was treated with 1 ml of 40% formaldehyde solution per 100 g of CP (Tiwari and Yadava, 1994). The individual groups of lambs were allotted one of the dietary treatment rations (Table 1) throughout the experimental period of 120 days.

Assessment of the treatments viz., replacement of CSC by untreated DMC and 1% HCHO-treated DMC and wheat bran by bakery waste for reducing cost of feeding and produce from the animals as influenced by the feeding regime, was evaluated by input and output in respect of body weight gain and wool produced at the end of the experimental period of 120 days.

Returns were calculated from market rates of individual feed ingredients, body weight and wool produced, prevalent at the time of study i.e., 1996. The cost of each ration for raising one lamb for a period of 120 days was found to be Rs. 256.8,

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Table 1. Physical composition of feed ingredients

Feed ingredients	Dietary Treatment			
	T ₁	T ₂	T ₃	T ₄
Cotton seed cake	38	—	—	—
De-oiled mustard cake	—	25	25	25
Wheat bran	22	25	25	—
Bakery waste	—	—	—	35
Barley	23	30	30	22
Guarkorma	12	10	10	11
Jaggery (Gur)	3	8	8	5
Salt	1	1	1	1
Min. Mix	1	1	1	1
Cost/100 kg	442.30	310.50	346.97	272.47
Conc. Mix (Rs.)				
Crude protein (%)	20.83	20.48	20.48	20.28

199.2, 216.0 and 183.6 in animals of T₁, T₂, T₃ and T₄ groups, respectively (Table 2). The reduction in feed cost in terms of percentage as compared to control (T₁) was found to be 22.43, 15.89, 28.50 in animals of T₂, T₃ and T₄ groups, respectively. The reduction in cost of feeding was maximum in animals of T₄ group, while wheat bran was replaced by bakery waste and it was 28.50% less as compared to cost of feeding in control group T₁. However, reduction in feed cost was also quite appreciable in T₂ and T₃ groups as compared to control (T₁), where CSC feed in T₁ group was replaced by unprotected

DMC in T₂ and 1% formaldehyde-protected DMC in T₃ group. Reduction in feed cost by feeding protected proteins with urea has been reported earlier by Mathur *et al.* (1992) in Magra sheep.

The cost for computation of 100 kg concentrate mixture was found to be Rs. 442.30, 310.50, 346.97 and 272.47 in the four respective groups.

The feed cost per kg live weight gain was also calculated and found to be Rs. 27.82, 28.70, 15.00 and 14.97 for T₁, T₂, T₃ and T₄ respectively. Feed cost per kg

Table 2. Economics of feeding per animal

Dietary treatment	Chopped Sewan Rs. day ⁻¹	Conc. mixture Rs. day ⁻¹	Total feed cost per animal day (Rs.)	Reduction in feed cost (%)	Feed cost per kg live wt. gain (Rs.)	Clean wool yield (g) mean±SE
T ₁	0.67	1.47	2.14	—	27.82	812.50±44.30
T ₂	0.62	1.04	1.66	22.43	28.70	671.0±16.39
T ₃	0.72	1.08	1.80	15.89	15.00	1131.25±48.32
T ₄	0.63	0.90	1.53	28.50	14.97	1201.5±27.43

live weight gain was minimum in T₄ group and almost similar in T₃ group.

It is concluded that replacement of cotton seed cake by 1% formaldehyde-protected de-oiled mustard cake and wheat bran by bakery waste at 100% level is safe, effective and economical for raising of lambs for meat and wool production.

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