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Economics of By-pass Protein and Urea Feeding in Sheep

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The economics of feeding involved in production have been of great concern in livestock pursuits. Treatment of concentrate with 1% formaldehyde is a safe, effective and economical method to by- pass the dietary proteins from excessive and wasteful ruminal fermentation and thereby resulting in improvement of growth, daily weight gain and feed conversion efficiency. A combination of by-pass protein and urea feeding have been reported to enhance growth, feed utilization (Mathur & Mathur 1989) and wool production (Mathur 1990). An experiment was undertaken to evaluate the economics of feeding by-pass protein with or without urea to sheep, at two important stages of sheep life.

Twenty four uncastrated male Magra lambs, completely weaned, of approximately 4 months of age with uniform body weight was distributed into 4 groups of 6 animals each by completely randomized design. Feeds used were guar (*Cyamopsis tetragonoloba*) meal , grass (*Lasiurus sindicus*), gur (Jaggery) and urea (NPN source). The air dried feed samples analyzed (AOAC 1980) were found to contain 43.75, 4.37, 0.00 and 291.25% crude protein, and 424, 418, 397 and 257 K cal (Gross energy) 100 g^{-1} dry matter, respectively. On the basis of analysis the experimental diets were computed keeping roughage-concentrate ratio of 55 : 45 so as to provide isonitrogenous and isocaloric diets.

For effective protein protection from by-pass ruminal degradation, the guar meal was treated overnight with 1 ml of 40% formaldehyde solution 100 g^{-1} of N and dried in sun (Schmidt *et al.* 1972)

The individual groups of lambs were allotted one of the following treatments throughout the experimental period of 360 days.

T_1	Untreated guar meal	Control.
T_2	Guar meal treated with 1% formaldehyde solution	By-pass protein.
T_3	Guar meal treated with 1% formaldehyde solution and supplemented with urea to replace 1/3 nitrogen	By-pass protein and urea supplemented.
T_4	Untreated guar meal supplemented with urea to replace 1/3 nitrogen	Urea supplemented.

Assessment of the treatment viz. by-pass protein and urea supplementation alone or in combination for reducing the cost of feeding and the produce from the animals as influenced by the feeding regime was evaluated by inputs and the outputs in respect of meat, hide and wool produced at two important stages i.e. marketable age of 10 months and adult age of 16 months.

Returns were calculated from the market rates of the individual feed ingredients, wool, mutton and hide, prevalent at the time of study i.e. 1985. The cost of each ration for raising one lamb throughout the study period of 360 days was found to be Rs 306.27, 318.87, 262.35 and 266.39 in T_1, T_2, T_3 and T4, respectively. The total cost of feeding in T2 was found to be higher by 4.1% as compared with control i.e. T_1, but in T_3 and T_4 the same was lower by 14.34 and 13.02%, respectively. Reduction in the cost of feeding by urea substitution in camel has been reported earlier also by Mathur *et al.* (1982).

The sheep products viz. wool and mutton were priced at Rs. 20.00 kg^{-1} and sheep skin, large and small at Rs. 8.00 and Rs. 10.00, respectively, for calculating value of output. The cost of feeding was found to be lowest with highest profit in T_3 at both

Table 1 *Balance of input, output and net profit*

Treatment	Output (Rs)				Total input cost (Rs)	Net profit (Rs)	Pre cent increase over T_1
	Wool	Mutton	Hide	Total			
			Stage–I				
T1	10.88	180.00	8.00	198.88	140.62	58.26	–
T2	13.00	187.40	8.00	208.48	146.82	61.66	5.83
T3	11.60	207.00	8.00	226.60	116.28	110.32	89.35
T4	9.90	182.98	8.00	200.88	121.25	79.63	36.68
			Stage-II				
T1	13.06	263.97	10.00	287.03	165.65	121.38	–
T2	16.00	279.00	10.00	305.00	172.86	132.94	9.52
T3	13.24	305.62	10.00	326.86	146.06	182.80	50.60
T4	13.50	276.37	10.00	299.87	145.13	154.74	27.48

The cost cited is of the prevalent market rates at the time of study.

the stages, however the maximum returns of 89.35% was observed in T_3 at the marketable age of 10 months.

It was concluded that Magra lambs could be raised economically on by-pass protein with urea and for maximum profit lambs should be disposed off at the marketable age of 10 months.

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