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EVALUATION OF BY-PASS PROTEIN AND UREA FOR WOOL PRODUCTION

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ABSTRACT

Studies on the comparative efficacy of utilization of native protein *vis a vis* by-pass protein with or without urea was conducted to assess the biological response on wool production, quantitatively and qualitatively. The wool production was highest in lambs fed by-pass protein. Staple length, staple crimps were found to increase, and modullation percentage was found to decrease, with the advancement of age in all the animals irrespective of treatment received.

INTRODUCTION

Wool is formed almost entirely of protein, the dietary protein or non-protein nitrogen source is expected to have a close bearing with the formation of wool. An experiment was planned and undertaken to evaluate the effect of feeding by-pass protein with or without urea on biological response of growth and quality of wool produced by desert sheep, keeping in view that ruminal degradation of good quality protein is a wastefull process.

MATERIAL AND METHODS

Twenty four uncastrated male Magra lambs completely weaned of approximately four months age of uniform weight and conformation were distributed by completely randomized design into 4 groups of 6 animals each. The local feeds were analysed in the laboratory for proximate principles (A. O. A. C. 1975), Calcium and phosphorus (Talapatra et al. 1940). Energy estimation was made by Adiabatic type parr oxygen bomb calorimeter. The experimental rations were computed on the basis of the results of laboratory analysis of feed (Table 1) keeping roughage concentrate ratio 55:45 and to provide iso-nitrogenous and iso-caloric status.

Locally available guar *(Cyamopsis tetragonoloba)* meal was used as a source of protein and was treated with 1 ml of 40% formaldehyde solution per 100 g of CP overnight and dried in sun (Schmidt et al. 1972) to by-pass ruminal degradation. As a source of readily available energy the animals were given 100 g of gur (Jaggary) per head per day. The animals were offered calculated amount of concentrate and were allowed to eat chopped seven grass *(Lasiurus sindicus) ad lib.*

Table 1. Chemical composition and calorific value of feeds incorporated in the experimental rations (% on D.M. basis)

Name of Feed	Dry matter	Crude protein	Ether extract	Crude fibre	Ash	Nitrogen free extract	Calcium	Phos-phorus	Gross energy (K.Cal.)
Sevan grass **(Lasiurus sindicus)**	91.3	4.3	3.6	33.1	8.2	50.5	1.44	0.04	418
GUAR CHURI **(Cyamopsis teragonoloba)**	92.2	43.7	5.7	7.8	9.1	33.5	0.30	0.50	424
GUR	87.6	—	—	—	—	—	—	—	397
UREA	—	291.2	—	—	—	—	—	—	257

The individual group of lambs were alloted 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 and supplemented with urea to replace one third nitrogen	:	By-pass protein and urea supplemented
T_4 Untreated guar meal supplemented with urea to replace one third nitrogen.	:	Urea supplemented

To evaluate the effect of feeding by-pass protein with or without urea on the quality and quantity of wool produced the lambs were clipped before the experiment (clip-I), and then after every six months i. e. at the market age of 10 months (clip-II) and at adult age of 16 months (clip-III). Following parameters were studied:

Quantitative attributes—Raw wool, dry wool, clean wool grease and suint.
Quantitative attributes—Staple length and staple crimps.
Fibre metrology —Fibre diameter and medullation.,

The measurement of the wool parameters, assessement of the wool production and its characteristics were in accordance with the standard procedures (I.S.I. 1964 and 1965, I.W.T.O. 1967, Ryder and Stephenson 1968).

RESULTS AND DISCUSSION

The quantitative attributes i.e. weight of raw wool and clean wool, percentage of grease and suint showed increasing trends from I to III clips, irrespective treatments, but the differences were not statistically significant. However, the wool production was highest in all the clips of animals of T_2 (Table 2). These findings are in agreement with the earlier observations of Bhargava et al. (1975), and Singh et al. (1980).

The qualitative attributes viz. staple length and staple crimps of the fleeces did not show statistically significant difference due to treatments for both the attributes, though the number of staple crimps per cm decreased a little bit in T_3.

Metrology of the fibre diameter and the content of medullated fibres from the samples of wool taken from the midside region showed slightly declining trends with the advancement of age in all treatment groups. The observations confirm the findings of earlier workers (Bhargava et al. 1975; Singh et al. 1980). The effect of treatments on the overall wool attributes, in general were in agreement with earlier report of Elliot and Topps (1964).

Table 2. Effect of feeding by-pass protein with or without urea on wool characteristics

Treatment	Quantitative attributes			Qualitative attributes				Fibre Metrology	
	Raw wool (g)	Dry wool (g)	Clean wool (g)	Grease (%)	Suint (%)	Staple length (cm)	Staple crimps (cm)	Fibre diameter (μ)	Madullation (%)
				I-Clip					
T_1	349	315	200	5.9	7.8	3.3	0.9	31.8	75.7
T_2	351	326	213	5.9	6.0	3.5	0.7	31.5	75.5
T_3	348	319	218	6.5	7.5	3.5	0.8	31.9	75.8
T_4	349	323	226	6.1	6.9	3.7	0.9	31.6	75.4
F Value	0.009 NS	0.012 NS	0.124 NS	0.137NS	0.463NS	0.099NS	0.159NS	0.127 NS	0.02 NS
				II-Clip					
T_1	544	520	410	10.3	6.3	6.6	1.2	30.5	68.6
T_2	650	623	466	12.2	6.3	6.5	0.9	29.8	67.0
T_3	558	547	438	10.9	6.5	6.9	0.6	29.3	63.5
T_4	495	449	371	13.3	6.3	6.8	1.1	26.7	70.0
F Value	1.034 NS	1.254 NS	0.751 NS	0.891 NS	0.193 NS	0.068 NS	1.586 NS	0.126 NS	0.402 NS
				III-Clip					
T_1	653	633	480	9.2	9.5	8.7	2.5	30.4	66.3
T_2	800	771	452	12.3	10.1	9.0	2.4	30.7	59.1
T_3	662	636	452	11.7	9.1	7.8	1.8	29.8	65.2
T_4	675	646	470	9.9	9.9	8.4	1.3	29.5	64.5
F Value	1.731 NS	1.736 NS	0.189 NS	0.052 NS	0.302 NS	0.287 NS	2.715 NS	0.211 NS	0.328 NS

NS : Non Significant

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