Annals of Arid Zone 48(2): 175-177, 2009

Short Communication

Utilization of Siris (*Albizzia lebbek*) Pods in the Concentrate Diet of Marwari Sheep

Ram Ratan, D.L. Bapna and R.K. Sawal
Central Sheep & Wool Research Institute, Arid Region Campus, Bikaner 334 006, India

Mutton production is one of the main aspects of sheep rearing in hot arid tropics. Small ruminants are mostly raised on pasture resources available on common grazing/fallow lands with minimal supplement feed. Supplementation in the form of concentrate/dry forages improved sheep productivity through efficient feed utilization. Siris, *Albizzia lebbek*, a deciduous tree adapted to tropical climate, is widely distributed throughout India. It has been found suitable for arid zone receiving less than 300 mm annual rainfall (Bhimaya *et al.*, 1963). Apart form leaves, which are consumed by ruminants, the pods can be incorporated in complete feeds of small ruminants (Santra *et al.*, 1998). The present investigation was conducted to study the extent of utilization of siris pods in the diet of Marwari sheep in hot arid region.

A total of 32 Marwari rams (age 3 years, live weight 36.6±1.2 kg) were divided into 4 groups of eight each and fed basal diet of 80% chaffed *Lasiurus sindicus* hay and 20% concentrate mixture. Siris pods were supplemented @ 0, 10, 15 and 20% in the concentrate supplement. Concentrates contained crushed maize, 35, 29, 24 and 18 kg. Guar korma (45, 44, 43 and 42 kg), wheat bran, 20, 17, 18 and 20 kg and mature dry ground siris pods (0, 10, 15 and 20 kg) in concentrate supplements of control (T_1) and treatment groups (T_2-T_4), respectively. Mineral mixture was used @ 200 g and common salt @ 100 g kg^{-1} of concentrate feed. Weekly live weight and daily feed intake were recorded during feeding trial of four months. At the end of experiment a 7d metabolic trial was conducted on 4 animals of each group to assess nutrient intake and digestibility. Samples of feed offered, faeces and left over were analyzed for proximate principles (AOAC, 1990) and urine samples were analyzed for nitrogen by *kjeldhal* method. The wa analyzed statistically (Snedecor and Cochran, 1968).

Siris pods contained higher fiber content due to the presence of hard pericarp embedding seed; slightly higher crude protein and lower ash content compared to earlier report (Tripathi *et al.*, 1996; Santra *et al.*, 1998) whereas, lower protein and higher fiber contents have also been observed by Singh *et al.* (1989). Compositional differences might be due to environment, soil and season of collection. Due to incorporation of siris pods in the diet, the concentrate mixtures contained higher contents of protein and crude fiber and lower content of nitrogen free extract (Table 1). Body weights of animals at the start and end of the experiment were not affected due to diet. Dry matter intake was not affected due to diet through increasing trend was observed with increase in pod content.

Digestibility of organic nutrients and nutritive value of diets were not affected due to increase in content of siris pods in the concentrate diet (Table 2), this could be due to similar proportion of concentrate to roughage (20:80). Nutrient intake among groups was related to feed intake of animals and it was adequate to meet nutrient requirement of adult sheep. Despite higher protein and fiber

Table 1. Chemcial composition of experimental feeds containing siris pod

Attributes	T_1	T_2	T_3	T_4	Siris pods	*L. sindicus* hay
Organic matter	93.50	90.67	89.37	88.82	92.78	93.47
Crude protein	25.92	29.14	28.03	28.42	17.00	5.68
Ether extract	2.75	3.15	2.89	3.26	2.30	1.40
Crude fiber	7.81	10.25	10.21	11.91	32.13	31.40
Nitrogen free extract	56.93	48.13	48.24	45.23	41.35	54.93
Ash	6.50	9.33	10.63	11.18	7.22	6.59

along with low NFE content of diets; protein availability to the body was not affected, probably due to medium protein quality of pods. Production of clean wool was not affected due to diet. Despite higher protein content in the concentrate diet of treatment groups (T_2-T_4), additional advantage in wool production was not observed though numerically higher nitrogen retention was observed, this could be due to increase in CF, decrease in NFE and decrease in CF digestibility. Statistical differences in clean wool production among groups were also not observed. Nitrogen intake, excretion in faeces and urine as well as its retention were not affected due to diet (Table 2). Efficiency of conversion of feed nitrogen into wool was also not affected. It is likely that supplementation of maize as energy supplement along with guar meal helped in better dietary protein utilization when fed along with *L. sindicus* hay. Results also suggest that supplementation of additional protein through siris pods did not improve wool efficiency reflecting its lower quality, but could be supplemented as a cheaper protein source in arid tropics.

The results of the study indicated that siris pods are moderate source of protein. Mature dry pods after grinding can be incorporated upto 20% in the concentrate diet without affecting

Table 2. Production performances of sheep fed diet containing siris pods under different treatments

Attrribute	T_1	T2	T_3	T_4
Initial weight (kg)	31.69±0.95	31.58±1.22	31.62±1.63	31.58±1.19
Final weight (kg)	38.89±0.95	34.86±1.33	36.34±1.45	37.95±1.48
Dry matter intake				
Concentrte (g d^{-1})	210.8±17.4	203.6±34.6	213.2±4.9	235.8±35.8
Lasiurus sindicus hay (g d^{-1})	804.6±59.3	773.5±139.5	814.8±23.2	896.7±132.0
Total (gm d^{-1})	1015.4±7.64	977.0±174.1	1027.9±27.6	1132.4±167.8
DMI g/$W^{0.75}$ (kg)	62.4±5.1	62.5±8.7	66.7±3.0	69.0±9.2
DMI % BW*	2.44±0.0048	2.45±0.0094	2.70±0.0021	2.67±0.012
Water intake % BW*	6.44±0.0032	6.37±0.0129	6.98±0.0077	7.94±0.0148
Clean wool production (g)	559.6±64.2	465.0±61.0	394.9±38.6	511.2±62.4
Nutrient digestiblity (%)				
Dry matter	48.85±1.02	48.15±6.37	43.48±1.85	45.53±3.90
Organic matter	53.35±1.42	51.23±6.05	47.10±1.71	48.15±3.76
Crude protein	57.58±0.81	59.28±5.16	53.73±2.86	55.20±2.53
Ether extract	54.73±2.18	49.05±7.76	50.85±5.10	51.95±3.45
Crude fiber	53.33±0.89	49.73±5.97	42.10±2.18	48.20±4.58
Nitrogen free extract	52.73±1.99	50.38±6.47	48.18±1.30	46.80±3.92
Nutritive value (%)				
Digestible crude protein*	5.88±0.003	6.42±0.011	5.66±0.006	5.82±0.003
Total digestible nutrients	51.00±0.372	48.48±5.760	44.60±1.622	45.83±3.675
Nitrogen intake (g d^{-1})				
Concentrate	8.7±0.7	9.5±1.6	9.6±0.2	10.7±1.6
Lasiurus sindicus hay	7.9±0.6	7.4±1.2	7.7±0.2	8.4±1.2
Total nitrogen intake	16.6±1.3	16.9±2.9	17.3±0.3	19.1±2.8
Nitrogen excretion (g d^{-1})				
Faeces	7.0±0.6	6.5±0.3	8.0±0.6	8.6±1.4
Urine	5.4±0.6	5.0±0.9	3.8±0.9	4.6±0.2
Total nitrogen excretion	12.4±0.5	11.5±1.2	11.8±0.9	13.2±1.4
Nitrogen retention (gm d^{-1})	4.2±1.1	5.4±2.1	5.5±0.7	5.9±1.7
Wool nitrogen	0.69±0.08	0.58±0.08	0.49±0.05	0.63±0.08
Nitrogen efficiency for wool (%)	4.08±0.014	3.23±0.020	2.77±0.020	3.25±0.009

*Reconverted from angles.

digestibility of organic nutrients, nitrogen balance, wool production and efficiency of conversion of feed nitrogen into wool in Marwari sheep.

References

AOAC 1990. *Official Methods of Analysis*. 15th Ed., Association of Analytical Chemists, Washington, DC.

Bhimaya, C.P., Kaul, R.N. and Ganguli, B.N. 1963. Species suitable for afforestation in different arid habitats of Rajasthan. *Annals of Arid Zone* 22(2): 162-168.

Santra, A., Misra, A.S., Chaturvedi, O.H., Prasad, R. and Jakhmola, R.C. 1998. Comparative utilization of complete feed containing siris (*Albizzia lebbek*) pods by sheep and goats. *Indian Journal of Animal Science* 68(10): 1075-1077.

Singh, N., Sharma, K. and Ogra, J.L. 1989. Chemical composition and nutritive value of siris (*Albizzia lebbek*) and subabul (*Leucaena leucocephala*) pods in goats. *Indian Journal of Animal Nutrition* 6(3): 259-261.

Snedecor, G.W. and Cochran, W.G. 1968. *Statistical Methods*, 6th ed., Oxford and IBH Publishing Company, Calcutta.

Tripathi, M.K., Karim, S.A. and Tyagi, A.K. 1996. Chemical composition of sirus (*Albizzia lebbek*) pods and leaves. *Indian Journal of Small Ruminants* 2: 52-53.