

Effect of type of tree leaves on intake, nutrient utilisation and rumen fermentation pattern in goat fed with *Cenchrus ciliaris* grass

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Introduction Grasses and tree leaves/shrubs are the major feeds available from grasslands and grazing fields. There is though a dearth of information on the nutritional value of tree foliage although available information was collated by Shelton *et al.* (1995). This study evaluated the relative nutritive value of two foliages for goats.

Materials and methods Four adult goats (local breed) with average body weight of 29 kg were fed *Cenchrus ciliaris*-*Leucaena leucocephala* (CL) and *C. ciliaris*-*Gliricidia optiva* (CG) in 50:50 proportions in a switch-over experiment. Goats were maintained on each dietary regimen for 3-4 months. After 45 d, a digestion trial was conducted to evaluate relative dry matter intake (DMI) and nutrient utilisation. Rumen liquor was collected (0 & 4 h post feeding) to estimate volatile fatty acid (VFA) and N-metabolite production. Data was analysed according to Snedecor & Cochran (1967).

Results and discussion Crude protein and lignin contents were 20.10 and 8.10 % in *L. leucocephala* and 16.87 and 2.76% in *G. optiva*, respectively. Dry matter intake (g/d) was comparable on the two diets. There was significantly ($P < 0.05$) higher CP digestibility on CG than CL. This may be due to lower tannin and lignin contents in *G. optiva* than *L. leucocephala*. The DMD was 10.17 units higher on CG than CL. Digestibility coefficients of cell wall polysaccharides (NDF, ADF and cellulose) were 10.5, 11.0 and 12.8 units higher on CG compared with CL. Mean pH and TVFA values (0 and 4 h post feeding) in rumen liquor were 7.01 and 85.27 on CL and 6.6 and 89.10 meq/l on CG based diets. Total N (mg/100ml) tended to be higher in the rumen liquor of goats fed CL than CG. Concentrations of $\text{NH}_3\text{-N}$ and TCA soluble-N were comparable on both the diets. Similar results for intake, nutrient digestibility and metabolite production for goats fed varying proportions of roughage and tree leaves have been reported by Adeloye (2000) and Bamikole *et al.* (2003).

Conclusions The goats utilised nutrients more efficiently from CG than CL based diets and rumen metabolite production was similar. *Gliricidia optiva* can be used as a quality fodder tree in grassland and silvipasture systems for improved goat production.

Table 1 Dry matter intake and nutrient digestibility in goats fed grass: tree leaf based diets

Diets	Nutrient digestibility (%)							
	g/d	g/kg w ^{0.75}	DM	OM	CP*	NDF	ADF	Cellulose*
<i>C. ciliaris</i> - <i>L. leucocephala</i>	733.2	61.14	47.06	49.81	46.76	46.56	40.08	50.20
<i>C. ciliaris</i> - <i>G. optiva</i>	771.7	60.9	57.33	58.63	71.18	57.00	51.00	63.00

* Differ significantly at $P < 0.05$ level

Table 2 Rumen metabolite concentrations in goats fed grass: tree leaf based diets

Diets	Rumen metabolites (mg/100ml)				
	pH	TVFA	Total-N	$\text{NH}_3\text{-N}$	TCA-soluble-N
<i>C. ciliaris</i> - <i>L. leucocephala</i>	7.01	85.27	104.35	17.36	68.41
<i>C. ciliaris</i> - <i>G. optiva</i>	6.60	89.15	98.25	16.81	70.43

References

- Adeloye, A.A. (2000). *Albizia lebbeck* in N supplementation of sorghum glume: nutrient digestion and N utilization of sheep. *Seventh International Goat Conference*, Tours, France, 84-85.
- Bamikole, M. A., O.J. Babayemi, O.M. Arigbade and V. J.(2003). Nutritive value of *Ficus religiosa* in West African dwarf goats. *Animal Feed Science and Technology*, 105, 71-79.
- Shelton, H. M., C.N. Pigginn & J.L. Brewbaker (1995). *Leucaena* - opportunities and limitations. *ACIAR Proceedings*, 57, Canberra, Australia.
- Snedecor, G.W. & W.G. Cochran (1967). *Statistical Methods*, Sixth ed. IBH Publishing Co., Oxford and New Delhi, 258-298.