

DIGESTIVE EFFICIENCIES OF GOATS AND SHEEP FED NATIVE PASTURE AND LEUCAENA HAYS

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Low quality forages are generally utilised more efficiently by goats than by sheep (Devendra and Burns 1983). *Imperata cylindrica* (Kunai), the dominant species in native pastures of Papua New Guinea, is of very poor quality. *Leucaena leucocephala* is a promising tree legume for incorporation in Kunai pastures. The relative digestive efficiencies of local goats and sheep when given these low and high quality forages were measured in this study.

Four local Priangan wether sheep and four local wether goats (average live-weight 21kg) fitted with rumen fistulae and housed in metabolism cages were given one of three diets A, B and C during 25 day periods, each animal receiving each diet in a random sequence. Diet A was Kunai hay sprayed with 30g urea/kg and fed ad libitum. Diet B was Kunai hay ad libitum + 300g/d of Leucaena hay (LH) to achieve equal intakes of the two forages. Diet C was 600g LH/D. Kunai hay and LH contained (g/kdDM) 4.8 and 49.4 N, 873.8 and 425.0 NDF and 63.2 and 81.3 ash, respectively. Urea-sprayed Kunai in diet A contained 12.2g N/kgDM. Feed intake and faeces and urine production were recorded during days 15-21 of each period. Cr-EDTA dosed into the rumen was used as the marker for rumen outflow measurements. Intake, digestibility, N retention and rumen outflow rate in goats and sheep.

	DIETS							
	A		B		C		Mean	
	Goats	Sheep	Goats	Sheep	Goats	Sheep	Goats	Sheep
DM Intake	403 *	279	595	613	519	519	506	470
Digestibility OM	0.34 *	0.29	0.46 *	0.40	0.53 *	0.49	0.44	0.39
NDF	0.38 *	0.32	0.49 *	0.41	0.54 *	0.51	0.47	0.42
DOMD	0.31	0.27	0.47 *	0.37	0.49	0.46	0.43	0.36
N retention(g/d)	0.25	-1.40	1.09	1.01	5.60	3.71	2.15	1.11
Rumen Outflow(/h)	0.143	0.201	0.138	0.202	0.156	0.223	0.145 *	0.209

*Species means differ significantly (P<0.05)

Goats had significantly higher intake of kunai hay than sheep, but the species difference was not seen with inclusion of good quality LH in B. Digestibility coefficients, particularly those of NDF, were consistently higher for goats than for sheep, the differences being larger for the poorer diets A and B than for C. Rumen fluid outflow rates were lower in goats than in sheep indicating longer retention time of digesta in the rumen of goats than in sheep. This may explain the consistently higher digestibilities observed in goats. Despite the addition of urea to diet A, animals remained in negative N balance indicating the likely deficiency of available energy in native pasture for N utilisation. When LH was fed ad libitum to all animals at the end of the digestion trial, intake was as high as 825 ± 134.4 gDM/d. Urine samples were analysed for the goitrogenic metabolite, 3-hydroxy-4 (1H) pyridone (DHP), derived from mimosine present in LH. Only 0.06 and 0.07% of 2,3-DHP were found in urine of goats and sheep respectively, levels which were lower than 0.35% of DHP found in urine of Australian goats devoid of DHP-degrading rumen microbes (Jones and Lowry, 1984).

It can be concluded that goats can digest low quality forages more efficiently than sheep. Goats and sheep in Papua New Guinea appear to be able to consume high levels of Leucaena in their diet and therefore Leucaena could be used with confidence to upgrade native pastures.

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