

EFFECT OF MASTICATION ON THE RELEASE OF NITROGEN FROM TROPICAL FORAGES

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Little information is available about the proportions of structural and soluble proteins in the cells of tropical forages, or of the rate at which those proteins become accessible to rumen microbes when the forages are eaten. As these factors will influence the quantity of protein that reaches the ruminant small intestine, studies have been made of the amounts of nitrogen that can be extracted from boluses collected from the oesophagus of cattle offered *Macroptilium atropurpureum* (Siratro), *Calopogonium muconoides* (Calopo), *Centrosema pascuorum* CPI 55697 (Centro), *Stylosanthes hamata* cv. Verano, *Leucaena leucocephala* cv. Cunningham, *Cenchrus ciliaris* (Buffel) and *Urochloa mosambicensis*.

Four mature Droughtmaster steers were transferred from pasture to pens each collection day. The oesophageal-fistula plug was removed and when the discharge from the fistula was free of plant material the steers were offered 1 kg lots of freshly harvested forages. Boluses were collected until the steers had finished eating. Samples (100-150g) were extracted in cold water (1L). Saliva contamination was estimated from the ratios of dry matter (DM) in feed and boluses. Nitrogen (N) was estimated by Kjeldahl techniques in feed, bolus, extracts and saliva.

The data (Table 1) indicate that nitrogen released (g/kg forage N) ranged from 76 to 142 for Verano, Leucaena and Calopo, from 197 to 230 for

TABLE 1 Release of nitrogen during chewing (mean $\pm$ SEM)

Forage	Forage N (g/kg DM)	Number of observations	N released (g/kg forage N)
Verano	34.5 $\pm$ 6.1	3	76 $\pm$ 3 ^d
Leucaena	37.4 $\pm$ 16.4	4	83 $\pm$ 11 ^d
Calopo	27.6 $\pm$ 5.2	4	142 $\pm$ 24 ^c
Centro	20.9 $\pm$ 8.2	4	204 $\pm$ 14 ^{bc}
Buffel	20.2 $\pm$ 3.6	4	230 $\pm$ 20 ^{ab}
Urochloa	24.1 $\pm$ 9.7	4	197 $\pm$ 9 ^{bc}
Siratro	26.1 $\pm$ 5.2	8	296 $\pm$ 20 ^a

a - d: values with same superscript do not differ; $p > 0.05$

Urochloa, Centro and Buffel and approximately 296 for Siratro. The higher values correspond to those observed for cell rupture in temperate species (Reid et al 1962, Hogan 1965). The lower values may be associated with small leaves/leaflets in Verano and Leucaena and with a reluctance by cattle to eat Calopo. The observed escape of appreciable quantities of forage protein from the stomach in sheep fed Leucaena (Bamualim et al 1984) is perhaps explained in part by the present observations.

Bamualim, A., Weston, R.H., Hogan, J.P. and Murray, R.M. (1984). Proc. Aust. Soc. Anim. Prod. 15:

Reid, C.S.W., Lyttleton, J.W. and Mangan, J.L. (1962). N.Z. J. Agric. Res. 5: 237.

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