AMMONIA REQUIREMENTS FOR RUMEN FERMENTATION

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The minimum concentration of rumen NH_3-N for maximal rate of rumen digestion by the microorganisms has been estimated to be 50-100 mg N/l (Satter and Roffler, 1977) or 235 mg N/l (Mehrez *et al.* 1977). In this experiment the NH_3-N requirements for DM digestion were measured in vivo in sheep given fibre-based diets.

Five rumen-fistulated sheep (25-35 kg) were given *ad libitum* freshly chopped *Pennisetum purpureum* forage alone (Expt 2), or this forage and 450 g/d of a supplement (Expt 1) containing 93% NaOH (5%) treated maize cobs, 5% molasses and 2% minerals (Control) or incorporating 2% urea (Urea A), 4% urea (Urea B) or 21.6% soyabean meal (Soya). Rumen fluid was sampled 6 times during the experimental day to measure pH and NH_3-N concentration, and duplicate nylon bags containing ground NaOH (5%) treated maize cobs or dried and ground mature *Pennisetum purpureum* forage were incubated in the rumen for 9 h and 24 h.

TABLE 1 Intake and rumen digestion with forage plus N supplements

		Expt 1 (n = 5)						Expt 2 (n=3)	
		Control	Urea A	Urea B	Soya	SEM	Prob	$\bar{x}$	± SE
Intake (g DM/d)									
Forage		414	526	558	584	43	NS	683	24
Supplement		316	378	298	370	35	NS	0	
Total		730	904	856	954	68	NS	683	24
pH		6.2	6.3	6.2	6.3	0.07	NS	6.8	0.14
NH_3-N (mg N/l)		32	90	133	114	21.4	**	121	13.7
Dig. maize cobs	9h	28	33	32	33	0.9	**	31	1.3
	24h	36	48	54	51	2.1	**	53	2.1
forage	9h	26	31	31	28	0.8	**	32	0.3
	24h	42	47	46	45	1.9	NS	47	1.9

Rumen concentration of NH_3N was increased with supplements containing urea or soyabean meal. The nylon bag DM digestion of both feedstuffs was increased by supplements. containing urea or soyabean meal. The results suggest that the minimum ammonia concentration for maximum fermentation of mature *Pennisetum purpureum* forage was between 32 and 90 mg NH_3-N/l, but for NaOH treated maize cobs was in excess of 133 mg N/l.

MEHREZ, A. Z., ØRSKOV, E. R. and McDONALD, I. (1977). Br. J. Nutr. 38: 447.

SATTER, L. D. and ROFFLER, R. R. (1977). Trop. Anim. Prod. 2: 248.

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