

NITROGEN (N) DIGESTIBILITY AND MICROBIAL N YIELD IN SHEEP AND
CATTLE FED LOW QUALITY ROUGHAGE

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Sheep have been shown to digest N better than cattle (Prigge et al. 1984), the same as cattle (Vona et al. 1984) and less than cattle (Van Rooyen and Van der Merwe 1983). Possible reasons for these species differences are presented in this paper.

Animals used, diets offered and other practices were as described by Amaning-Kwarteng et al. (1985). Rumen bacteria were isolated from rumen fluid samples and the proportion of bacterial N in abomasal digesta N (% bact.) determined as DAPA:N of whole digesta divided by DAPA:N of bacterial fraction. Bacterial N flow was calculated by multiplying total digesta N by % bact. Estimates of rumen fractional outflow rates (FOR) of liquid and solids were determined with reference to Cr and Yb dilution rates respectively.

Nitrogen (N) digestibility and bacterial N yield in sheep and cattle fed treated straw alone (W) or with cotton-seed meal (WC) or barley (WB)

	Species (Sp)		Diet (D)			SED	Significance
	Sheep	Cattle	W	WC	WB		
Total N intake (g/kg ^{1.0})	0.61	0.57	0.51	0.73	0.54	0.071	D*
Abomasal N flow (ANF)(g/d)	17.8	118	60.1	78.4	65.3	2.28	Sp** D* SpxD*
Bacterial N in abomasal digesta N (%)	81.5	68.0	77.6	71.1	75.5	2.46	Sp** D*
Bacterial N flow (g/d)	14.5	80.2	46.6	55.7	49.3	3.28	Sp** D* SpxD*
g bacterial N/kg OMADR†	33.5	33.1	34.8	39.4	32.4	1.52	D*
Apparent N digested							
In whole tract (%)	74.5	65.0	68.2	72.7	68.5	1.76	Sp** D*
In intestine (% of ANF)	69.1	62.2	61.6	64.8	62.2	2.76	Sp*
FOR‡: Cr-EDTA (h ⁻¹)	0.086	0.142	0.110	0.120	0.113	0.0067	Sp** SpxD*
FOR: Yb (h ⁻¹)	0.050	0.057	0.055	0.055	0.050	0.0034	Sp*

* P < 0.05; ** P < 0.01; SED, for Sp x D interactions means.

†OMADR, organic matter apparently digested in rumen.

‡FOR, fractional outflow rate.

The higher apparent N digestibility in the whole tract of sheep was associated with a higher proportion of bacterial N in abomasal N of sheep, and was accounted for by greater apparent N digestibility in the intestines of sheep than cattle. The latter may be due to greater digestibility of bacterial than feed N on these diets. The lower proportion of bacterial N in abomasal N in cattle suggests less rumen degradation of dietary N in cattle which is likely due to higher FOR. Efficiency of bacterial N synthesis in the rumen was similar in sheep and cattle despite differences in FOR (see Kennedy et al. 1976).

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