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Brief Communication

THE NUTRIENTS AVAILABLE TO GRAZING CATTLE

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Nutritional experiments with grazing animals are frequently difficult to interpret because accurate methods of measuring food intake and utilisation have not been available. At the Grassland Research Institute, Hurley, experiments have been conducted where the organic matter (OM) digested in the rumen and the protein entering the duodenum of grazing calves have been measured.

Twenty-four Friesian calves, 5 months old at the start, were each prepared with cannulas in the rumen and proximal duodenum: 12 were housed indoors and fed known amounts of herbage, and 12 were grazed outdoors. A further 9 calves were housed indoors and used to measure digestibility and N retention. Portable pumps were used to infuse markers (Cr-EDTA and Ru-phenanthroline) into the rumens of the cannulated calves, while collection of duodenal digesta was made with fully automatic portable samplers. Five diets were compared: perennial ryegrass at 3 maturities and white clover at 2 maturities. Primary growth ryegrass was fed during Period 1 (2.5.79 to 23.5.79), trimmed primary growth in Period 2 (24.5.79 to 13.6.79) and a regrowth in Period 3 (14.6.79 to 4.7.79). Very mature white clover was fed in Period 4 (5.7.79 to 1.8.79) and a regrowth in Period 5 (2.8.79 to 30.8.79).

Differences in diet utilisation were found (Table 1); less OM was digested in the rumen and conversely more entered the duodenum on the clover treatments; differences in N digested in the rumen, N entering the duodenum and N retention were not influenced by pasture species but were closely associated with N intake, which was in turn determined by the N content of the diets; there were large losses of N from the rumen at high N intakes. This was a different result from that obtained in previous indoor work with sheep (Ulyatt and MacRae, 1974; MacRae and Ulyatt, 1974), where OM entering the duodenum was similar but N significantly higher with white clover. The well-known superior efficiency of utilisation of white clover can not therefore be attributed solely to increased protein supply. There is a suggestion, however, that the animals'

TABLE 1: DIGESTION OF PERENNIAL RYEGRASS AND WHITE CLOVER AT DIFFERENT STAGES OF MATURITY (DATA CALCULATED FOR A 200 kg CALF CONSUMING 4400 g OM/d)

	<i>Perennial ryegrass</i>			<i>White clover</i>	
	<i>Primary</i>	<i>Trimmed</i>	<i>Regrowth</i>	<i>Mature</i>	<i>Regrowth</i>
OM digested in rumen (g/d)	2350	2624	2596	2002	1844
N intake (g/d)	164.0	114.5	107.5	185.3	214.5
N digested in rumen (g/d)	30.8	0.3	-5.9	52.3	59.3
N entering duodenum (g/d)	133.3	114.2	113.4	134.0	155.2
N retention (g/d)	35.1	18.9	18.0	37.1	46.3

tissues receive a higher ratio of absorbed protein to energy (g protein at duodenum/g OM digested in rumen) when fed white clover (0.48) than when fed perennial ryegrass (0.29).

REFERENCES

- MacRae, J. C.; Ulyatt, M. J., 1974. *J. agric. Sci., Camb.*, 82: 309.
 Ulyatt, M. J.; MacRae, J. C., 1974. *J. agric. Sci., Camb.*, 82: 295.