PROTOZOAL NUMBERS IN THE RUMEN AND OMASUM OF CATTLE FED KIKUYU GRASS

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The amino acids flowing to the duodenum of ruminants consist of undegraded feed protein, microbial and endogenous protein. However, the contribution of protozoal protein to microbial protein is not clear. Concentrations of protozoa in the omasal fluid were found to be usually less than 20% of rumen fluid concentrations in sheep (Weller and Pilgrim 1974) and in cattle at slaughter (Bird et al. 1978). This paper reports measurements of the numbers of protozoa in rumen and omasal fluids of steers given kikuyu grass hay (Pennisetum clandestinum) at three levels of intake.

Six rumen-fistulated steers (300 kg live weight) were given three levels of kikuyu hay using a latin square switchover design, in eight equal portions at 3-h intervals. Omasal samples (obtained by suction through a tube passed into the omasum via the rumen) and rumen samples were strained through four layers of cheese cloth. The fluid samples were preserved in 10% formol saline and counted microscopically (Table 1) using a counting chamber 0.2 mm in depth. Entodiniomorph protozoa were grouped as large (>100,000 μ^3), medium and small (<10,000 μ^3).

TABLE 1 Protozoa1 numbers in rumen and omasal fluids of steers

Organic matter intake (kg/d)	Site	Protozoa ($X10^{-4}$/ml)				Total
		Holotrichs	Entodiniomorphs			
		Large	Large	Medium	Small	
4.4†	Rumen	0.9±0.3≠	1.8±0.1	3.4±0.2	6.5±1.0	12.6±1.1
	Omasum	0.5±0.1	0.9±0.1	1.9±0.1	1.9±0.2	5.2±0.4
3.6	Rumen	0.9±0.3	1.5±0.2	2.7±0.3	5.7±1.0	10.8±1.3
	Omasum	0.7±0.2	0.8±0.1	1.7±0.1	2.1±0.2	5.3±0.4
2.8	Rumen	0.7±0.2	1.1±0.1	2.7±0.3	4.9±0.5	9.4±0.4
	Omasum	0.4±0.1	0.8±0.1	1.5±0.1	2.2±0.1	4.9±0.2

† 0.9 x ad libitum.
≠ Standard error.

The mean number of protozoa in the rumen liquor was 1.09 x 10^{-5}/ml and that in the omasum 0.51 x 10^{-5}/ml. Protozoa1 numbers in the rumen increased with feed intake but the numbers in omasal fluid did not change. The ratio of protozoa1 numbers in omasal fluid relative to rumen fluid was 0.64 for holotrichs and respectively, 0.57, 0.58 and 0.36 for the large, medium and small entodiniomorphs.

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