

INTAKE, RUMINAL FLOW AND DIGESTION IN GOATS FED AD LIBITUM

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Goats are often considered to be 'different' but have many characteristics making them suitable for studies on the interaction between nutrition and reproduction/lactation in ruminants. These characteristics include (1) a shorter gestation period than in cows, (2) one to four fetuses, probably reflecting variations in ovulation rate and metabolic load during pregnancy, (3) a high frequency of twins of the same sex, favouring the design of experiments on the basis of paired comparisons, and (4) milk production per unit of metabolic weight in some breeds comparable to that of dairy cattle. However, differences in digestibility of food between goats and other ruminants have been reported, and tentatively attributed to differences in the extent of urea recycling and to rate of passage and retention time of digesta (Devendra 1982).

In the course of a study of the nutrition of pregnant and lactating ruminants, eight adult female feral goats were rendered anoestrous by the administration of a progestagen for a 3-week period. The animals had been cannulated at the rumen and duodenum and were maintained in metabolic cages, on an oat chaff and lupin seed diet (947 g organic matter and 15.5 g nitrogen/kg dry matter) offered ad libitum at 2-hourly intervals. The goats weighed between 36 and 52 kg and were in positive nitrogen balance. ^{103}Ru phenanthroline and ^{51}Cr EDTA were used as markers to estimate ruminal mean retention times of particles and solutes, respectively (Faichney 1980).

Over a range of dry matter intakes (I) from 352 to 851 g/d the relationships between intake (g/kg body wt/d) and the reciprocal of mean retention times in hours of ^{103}Ru phenanthroline (K_p) and ^{51}Cr EDTA (K_s) in the rumen were as follows:

$$I = 239 K_p + 2.8 \quad (r = 0.924, P < 0.01)$$

$$I = 154 K_s + 2.9 \quad (r = 0.900, P < 0.01)$$

Digestibility of organic matter in the whole gut was not directly related to dry matter intake, but was related to the ruminal mean retention time of the particulate marker (T, h) as follows:

$$\% \text{ digestibility organic matter} = 0.432T + 62.30 \quad (r = 0.753, P < 0.05).$$

These results are comparable with those obtained from similar studies on sheep and cattle (Poppi et al. 1981) and indicate that, in terms of responses in ruminal flow and digestion to variations in dietary intake, the goat is representative of other ruminants. Since changes in voluntary food consumption are a major nutritional adaptation to reproduction in female mammals, the results suggest that goats are suitable as experimental animals in the study of nutritional and reproduction interactions in ruminants.

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