

Some Observations on the Grazing Intake of Sheep

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Observations on the herbage intake of sheep were made over a 12 month period, on a group of ten grazing Corriedale wethers. The sheep were in a Mediterranean-type environment and the pasture was predominantly **Lolium rigidum** with some **Trifolium subterraneum** and **Danthonia** spp. The regression of faecal nitrogen on digestibility, which has been used successfully by Lancaster (1949), Raymond et al. (1954) Hutchinson (1956) Fels et al. (1959) and other workers, was calculated for three caged sheep. Feed for the caged sheep was cut daily from a 15 acre paddock, by clipping the pasture enclosed in randomly placed frames to ground level, with a shearing-type handpiece. The feed, feed residues and faeces from the caged sheep were analysed for moisture, crude protein and ash content, and similar determinations were carried out on the faeces of the grazing sheep. Consecutive seven day collection periods were used to establish the following regression equations:-

- (i) feed to faeces ratio on faecal nitrogen (per cent.),
- (ii) nitrogen intake (per cent.) on faecal nitrogen (per cent.),
- (iii) nitrogen intake (g) on faecal nitrogen (g) ,
- and (iv) organic matter intake (g) on faecal nitrogen (g).

At present, it is generally argued that regressions derived from 12 months' data are of limited use, because their standard errors are too large. In the present work, however, one regression was calculated for the period and using this regression, the following quantities were calculated for the grazing sheep.

Organic Matter Intakes.—There was a marked variation in the intakes between sheep, which was correlated with the liveweight of the sheep. O.M. intakes were found to range from approximately 800 g per day in early February to 1800 g per day towards the end of November. Intakes were at a maximum at the time when the ryegrass was just in seed head and not when the pasture was actively growing, lush and green.

Digestible Organic Matter Intakes.—The intake of D.O.M. followed a pattern very similar to O.M. intake, but it was more closely correlated to the liveweight of the animal.

Nitrogen Intake (per cent.).—These figures, which are an index of the chemical composition of the diet selected by the grazing animals, ranged from approximately 1.0 to 3.7 per cent. and were highest in early October. No consistent relationship existed between the O.M. intake and the per cent. nitrogen intake; generally the two increased together, but in early November, O.M. intakes were increasing slowly and the per cent. nitrogen intake was decreasing rapidly.

Nitrogen Intake and Apparent Nitrogen Digestibility.—The lowest nitrogen intake, calculated from O.M. intake and per cent. nitrogen intake, was approximately 12 g per day. As the stocking rate used in this experiment (one sheep per acre) was less than that usually used in farming practice on pastures of this type, it is likely that the nitrogen intake of grazing sheep is normally less than this.

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An exponential relationship was found between nitrogen intake (g) and faecal nitrogen (g), and the relationship between the logarithm of nitrogen intake (g) and faecal nitrogen (g) was therefore linear over the range of nitrogen intake observed. However, only a limited range of nitrogen intakes was possible with the caged sheep, and an assumption that this relationship is linear over a wide range is evidently invalid because unreasonably large values for O.M. intakes were calculated when using regressions (ii) and (iii).

REFERENCES

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DISCUSSION

J. Lambourne (N.S.W.) .-At Armidale there was a fairly good correlation between rate of liveweight change and intake of digestible organic matter (D.O.M.) in grazing animals, and no reason to suppose that intake of digestible protein was critical. Maintenance requirements of sheep as defined by the regression of weight change on D.O.M. intake were found to depend on the environment. Grazing sheep required from 10 to 250% more D.O.M. than pen-fed sheep according to whether they were maintaining weight in abundant or in sparse pasture — indeed maintenance requirements had even been found to vary *inversely* with live-weight when the heavy sheep were in abundant and the light sheep in very sparse pasture, as generally occurred. Authors' conclusion might be modified if, as he believed, maintenance requirements of grazing animals were generally well above Brody's figures.

Answer.—It was pointed out that on the other hand Dr. Graham at Prospect suspects that Brody's figures are too high.

Dr. D. E. Tribe (Vic.) felt that it didn't prove that protein is limiting throughout Australia but rather suggests that it might be.

J. Lambourne (N.S.W.) .-Using tropical pastures with very low protein levels, Milford suggested sheep will voluntarily reduce energy intake to economise on nitrogen.

P. G. Schinckel (N.S.W.) felt that this was an observation, not an experiment and that's why the difficulty of interpretation is occurring.

Dr. I. D. McDonald (N.S.W.) .—Milford's work has shown that in some sub-tropical species there is extremely low digestibility of nitrogen but very high digestibility of other nutrients.

R. J. Moir (W.A.) feels that the interdependence of nitrogen and other factors must be considered. He quotes an example where he had maintained a digestibility of 60-70% on 2 or 3 gm. of nitrogen intake in a recent observation by giving 15 gm. of casein to a sheep per duodenum. On another occasion a single dose of 50 g. increased the intake of fodder by 50% overnight.