THE VOLUNTARY CONSUMPTION OF ROUGHAGES BY SHEEP RECEIVING SUPPLEMENTS

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The physiological basis for the decline in voluntary roughage consumption (VRC) in ruminants fed cereal grain supplements is not clearly established. The present studies, related to this general topic, were conducted using a medium-quality roughage comprising equal parts of chopped lucerne and wheaten hays offered ad libitum.

The Border Leicester x Merino sheep used were given various supplements for 14 days or longer, generally as one meal each day, at c. 25 g per 100 g VRC in control periods; change in VRC was measured. The mean residence time of marker (51Cr-EDTA) in the rumen and ruminating activity were measured as previously described (Weston and Hogan 1967). VRC decline has been expressed as g%, i.e., decline in VRC (g) per 100 g supplement given.

The studies showed that (i) VRC decline was similar (70-73%) for the following supplements: whole wheat, ground and pelleted wheat, and ground and pelleted wheat + protein supplement + minerals (100:25:3), (ii) VRC decline was essentially the same when whole-wheat supplement was given as 1 meal/day or as 8 meals/day (73 g% v 77 g%), (iii) VRC decline was 18-22% less (p < 0.05) with whole wheat + bicarbonates supplement than with whole wheat supplement, in these studies sufficient bicarbonates to prevent the observed drop in rumen digesta pH with wheat supplement alone were provided by intraruminal infusion of a mixture of NaHCO3 and KHCO3 (4:1), (iv) VRC decline was 62 g% and 40 g% respectively when a mixture of glucose + casein + urea (100:10:3) or the same mixture + Na and K bicarbonates (as above) was infused intraruminally, (v) VRC decline was less (p < 0.05) at 52-55 g% with protein concentrates than with wheat, (vi) wheat supplement did not increase rumen marker residence time or decrease rumination, and (vii) the pattern of roughage eating during the day was little affected by wheat supplement given once daily.

It is suggested that the VRC decline cannot be attributed to a deleterious effect of supplement on digesta propulsion from the rumen or rumination (see (vi) above). Again, the consequences of rapid fermentation of supplement, operating via either the alimentary tract or the C.N.S., do not appear to be important (see (ii) and (vii)). Change in rumen digesta pH accompanying supplementation contributed to the change in VRC (see (iii) and (iv)), but other factors possibly relating to starch digestion could also be involved (see (iv) and (v)).