

THE EFFECT OF SUPPLEMENTATION WITH MOLASSES/UREA BLOCKS ON RUMINAL DIGESTION

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The level of ammonia needed to support maximum microbial growth in the rumen is 50-80 mg N/l rumen fluid (Satter and Slyter 1974) but higher levels may be required for maximum rate of fermentation (Mehrez et al 1977; Miller 1973).

For animals on low quality pastures, blocks containing molasses/urea are an established means of administering urea. The studies reported here examine two aspects (1) whether an animal would consume enough block to provide ammonia levels for maximum fermentation rate and (2) whether increased levels of rumen ammonia would increase the rate of digestion of pure cellulose or a low quality forage.

Three penned sheep were established on a diet of oaten chaff (1.4% N, 51% DM digestibility) and then, in successive periods, given free access to molasses/urea blocks containing 10, 15 or 20% urea. Nylon bags were used as a means of estimating the rate of digestion of washed cotton wool (a pure cellulose source) or oaten chaff. Dry material (1-3 g) was placed in nylon bags which were suspended in the rumen of the sheep during each period. The bags were removed after 6, 12, 24, 48 and 72 h, and the results for log (fraction of DM remaining) v. time were fitted by least-squares regression. The results are shown in the Table. When molasses/urea blocks were given the rumen ammonia concentrations always exceeded those recognised as adequate, nevertheless, the fractional rate of digestion of cotton wool continued to increase at the higher levels of supplementation which were associated with increasing rumen ammonia concentrations. A similar but non-significant trend existed for oaten chaff.

TABLE Fractional rates of digestion of cotton wool and oaten chaff from nylon bags in the rumen, and rumen ammonia concentrations

Diet	Fractional rates of digestion (% DM/d)		Rumen ammonia* (mg N/l)	
	Cotton wool	Oaten chaff	Mean	Range
Basal	0.19 ^a	0.14 ^a	23	8-66
10% urea	0.38 ^b	0.16 ^a	131	93-209
15% urea	0.76 ^c	0.23 ^a	210	131-305
20% urea	0.75 ^c	0.21 ^a	317	285-342

*Mean of 12 samples taken at 2 h intervals for 24 h.

Different superscripts within columns denote values that are significantly different (P<0.05).

The results indicate that rumen ammonia, at levels that are higher than those currently recommended, or some other ingredient supplied by the molasses/urea blocks, increased the fractional rate of digestion of pure cellulose and possibly of oaten chaff.

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