NITROGEN SUPPLEMENTS TO THE ABOMASUM INCREASE VOLUNTARY FOOD INTAKE IN SHEEP FED CEREAL STUBBLE

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The protein content of cereal stubbles is low and nitrogen supplementation to sheep fed these diets can increase voluntary feed intake (VFI) (Egan and Moir 1965).

In sheep fed diets of low digestibility, intakes of dry matter (DM) and metabolizable energy (ME) increase as the digestibility of the diet increases. For more digestible diets (>ca 65%) intake of ME is maintained, but DM intake declines as the digestibility increases. Over the lower range of digestibilities intake appears to be limited by a slow rate of clearance of organic matter from the rumen. At the higher digestibilities intake appears to be limited by the animal's inability to use more energy (Weston 1985).

We examined how nitrogen nutrition influences the VFI of sheep fed roughage diets of similar composition that differed markedly in digestibility. We tested the hypothesis that as the digestibility of the diet increases, the supply of amino acids to the small intestine has an increasingly important influence on feed intake.

Eight sheep were stratified and allocated to two groups on the basis of live weight and rumen volume. Two diets were offered ad libitum, one to each group. Both diets were based on wheat stubble and were of similar nitrogen content (0.5% N), but one was treated with alkali to increase its digestibility. Additional nitrogen, either as urea or casein was infused into the abomasum of all sheep for periods of six days. Each infusion supplied 10 g of nitrogen per day. Sodium phosphate (1% solution) was infused for six days as the control.

TABLE 1 Voluntary feed intake (g dry matter/day)

Digestibility of diet	Control infusion Mean	SEM	Urea infusion Mean	SEM	Control infusion Mean	SEM	Casein infusion Mean	SEM
Low (ca 45%)	488	30	578	26	503	47	664	27
High (ca 65%)	521	20	768	34	578	26	774	32

Infusions of urea or casein increased the VFI of each diet (Table 1) and VFI remained high for the six days of the treatment. The response occurred within three hours of the start of infusion. The VFI of the less digestible diet was greater during the casein infusion than during the urea infusion. On the highly digestible diet the increase in VFI was similar with infusion of either casein or urea. The responses in VFI of the poorly digestible diet to infusion of either casein or urea are consistent with the results reported by Egan and Moir (1965), but the response to urea occurred more rapidly. The effects on VFI of casein and urea supplementation may be through a common mechanism(s), and our current studies of ruminal activity and nitrogen flows at the abomasum are designed to understand them.

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