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BRIEF COMMUNICATION

The Effect of Peramine Ingestion in Pen-fed Lambs

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INTRODUCTION

Lambs grazing perennial ryegrass, (*Lolium perenne* L.), infected with the endophyte (*Acremonium lolii*) frequently exhibit diarrhoea within a few days of introduction to pasture (Eerens *et al.*, 1992; Pownall *et al.*, 1993). There may also be a link between this and unconfirmed reports of reduced feed intake. Several alkaloids are known to be associated with the endophyte, including the staggers-inducing lolitrem B, and the ergot alkaloid, ergovaline. Both of these tended to be concentrated toward the base of the vegetative plant while the factor(s) responsible appeared to be evenly distributed throughout the plant (Pownall *et al.*, 1993). There was a possibility that the alkaloid and insect feeding deterrent, peramine, because of its even distribution, was responsible (Pownall *et al.*, 1993; Keogh and Tapper, 1993). Peramine has been regarded as a non-toxic insect resistance factor in screening endophyte strains and the chance that it may be toxic to animals was of sufficient concern to prompt this investigation.

MATERIALS AND METHODS

Wether lambs housed in metabolism crates, were fed *ad libitum* rations of 3:1 low energy sheep nuts: lucerne hay and were stabilized for 21 days prior to treatment application. Synthetic peramine (Brimble and Rowan, 1990) as the hydrochloride salt (82% peramine) was dissolved in 1:37 methanol:water giving a solution concentration of 1.0 mg peramine/ml (0.00038 mol/l) and confirmed by UV analysis. This was administered orally to 4 of the 13 animals twice daily, at a rate of 40 mg peramine/head/day for 5.5 days and at 80 mg peramine/head/day for a further 1.5 days. Control animals were given a 1:37 methanol:water solution at the same rate and frequency throughout. Feed intake, faeces output (g DM), and water intake and output including proportioning (faeces:urine), were monitored throughout the experiment.

RESULTS

Treated animals showed no differences from controls in feed intake, faeces output and resultant *in-vivo* digestibility. Similarly, water intake, urine output and faecal moisture were unaffected by treatment throughout the experiment. Although digestibility of the feed offered was only 50%, consumption averaged 1500 g DM/head/day and all animals gained liveweight.

DISCUSSION

The primary objective of this experiment was to determine the effect of peramine when fed to lambs. It is acknowl-

TABLE 1: Mean daily measurements for each treatment.

	Untreated control	S.E.	Peramine treated	S.E.
Feed intake (gDM)	1497	(46.1)	1491	(52.0)
Faeces output (gDM)	764	(26.9)	758	(31.0)
<i>In vivo</i> digestibility (%)	49.0	(0.614)	49.2	(0.843)
Total water intake (ml)	3521	(214)	3619	(271)
Urine & faecal water output (ml)	2470	(156)	2576	(249)
Faecal moisture (%)	71.3	(0.90)	72.3	(1.31)

edged that the use of a dry feed diet was somewhat artificial and that the result obtained can only be applied to the conditions described. The use of fresh herbage other than ryegrass was considered to have limited relevance and the possibility of mycotoxin presence precluded ryegrass as an option.

The amount of synthetic peramine available was limited and consequently only 4 animals were treated. In addition, the treatment was administered separately rather than mixed into the feed to prevent loss or variation in peramine ingestion.

The 40 mg rate administered corresponds to the upper levels recorded in endophyte-infected ryegrass, assuming a daily intake by the animal of 1300 g DM (Keogh and Tapper, 1993). The rate was doubled over the final period of the experiment to confirm the result.

Although the factors responsible for high faecal moisture in lambs consuming endophyte-infected ryegrass remain unknown it is unlikely that peramine, the alkaloid which inhibits Argentine stem weevil (*Listronotus bonariensis*) feeding, is responsible for increasing faecal moisture or reducing feed intake. With the probable exclusion of peramine as an animal toxin, further studies are needed to identify the endophyte-related factors affecting animal health.

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