Rumen-protected methionine or barley supplements for parasitised Merino lambs

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Extra dietary protein (Coop and Holmes, 1996) or non-protein nitrogen (Knox and Steel, 1996) helps nematode infected sheep to compensate for the reduced voluntary feed intake and endogenous losses of protein in the gut. The high cost of protein supplements, however, restricts the practical application of this knowledge and less expensive ways of obtaining the same benefit were investigated.

Four diets were compared:

1 BS (basal; chaffed oaten hay plus 2% urea);

2 SM (basal + 2 g 'Smartamine'; rumen–protected methionine from Rhone Poulenc Animal Nutrition) to provide what is generally considered to be the primary limiting amino acid as a specific supplement;

3 CS (basal + 200 g cotton seed meal) to provide a similar amount of methionine as in 2 but with a broader range of amino acids and some additional energy; and

4 BV (basal + 200 g barley premixed with 4 mg of Virginiamycin; Smith, Kline & Beecham Animal Health) to provide a similar amount of energy as in 3 and extra microbial protein. The virginiamycin was added to overcome problems of grain feeding.

These diets were fed to 63 (4 months old; 18.5 kg) Merino lambs.

The lambs were kept indoors and accustomed to the basal diet for 1 month. They were drenched with Ivermectin (MSD; 2.5 ml/10 kg liveweight) and confirmed to be worm–free 3 weeks later. They were then weighed and allocated at random to treatments. Half of the lambs from each diet were uninfected–controls and the other half were each infected 3 times per week with both 200 ***Haemonchus contortus*** and 1200 *Trichostrongylus colubriformis* larvae (L,) for 12 weeks. Feed and water were continuously available. Liveweight and faecal worm egg counts were recorded.

The results are shown in Figures la, b, c, and d. Weight gain differed ($P<0.05$) between diets, but faecal egg counts did not differ ($P>0.05$). Mortality in infected groups was considerable. There was no response to Smartamine in infected or uninfected lambs.

Contrary to previous studies, none of the diets prevented the onset of clinical disease. This is surprising and may indicate a high level of susceptibility and a severe parasite challenge. By week 12 there was an indication that supplementary feeding had a positive effect on survival. It is possible that lack of a liveweight response to Smartamine may be related to gut fill or to the fact that a broader range of amino acids is required.

References

Coop, R.L. & Holmes, P.H. (1996). Nutrition and parasite interaction. *International Journal for Parasitology 26,* 95 l-962.

Knox, M.R. & Steel, J. W.(1996). Nutritional enhancement of parasite control in small ruminant production systems in developing countries of south-east Asia and the Pacific. *International Journal for Parasitology* **26**, 963–970.

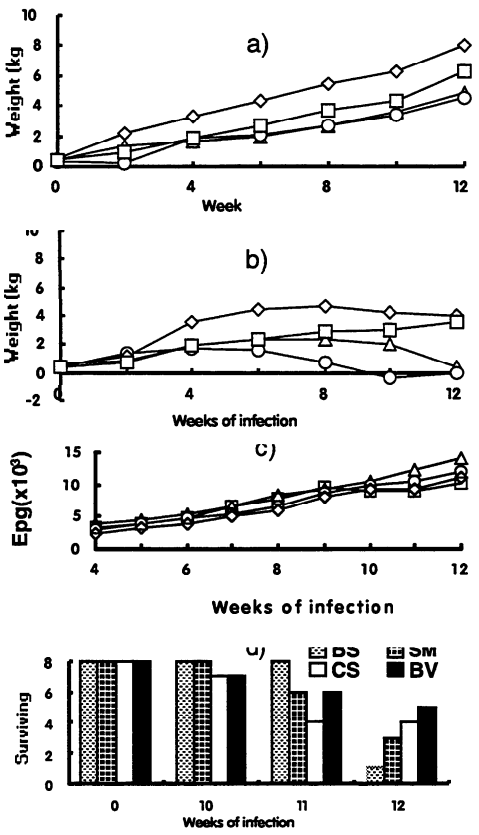

Figure 1 a) Weight gain of uninfected lambs, b) weight gain of infected lambs, c) geometric means of faecal egg counts (epg), for ∇ = BS; O= SM; ◊ = CS; □ = BV and d) number of lambs surviving per group (n = 8).