

## PROTECTED PROTEIN REDUCES THE FAECAL EGG COUNT OF WEANERS EXPOSED TO GASTROINTESTINAL PARASITES

R.M. SMITH<sup>a</sup>, J.E. HOCKING EDWARDS<sup>a</sup> and R.A. DYNES<sup>b</sup>

<sup>a</sup> Faculty of Agriculture, Animal Science, University of Western Australia, Nedlands, W.A. 6907

<sup>b</sup> CSIRO Division of Animal Production, Private Bag, PO Wembley, W.A. 6014

Growing lambs infected with gastrointestinal parasites are in a state of induced protein deficiency at a time of maximum growth potential and when an effective immune response is required (Bown *et al.* 1991). The present experiment investigated the effect of supplementation with protected protein on the development of immunity in growing lambs.

Sixteen 12-week old Merino wethers were stratified by liveweight and randomly allocated to 1 of 2 groups (mean liveweight  $17.6 \pm 0.38$  kg;  $n=8$ ). All sheep received 5000 *Trichostrongylus colubriformis* and 3000 *Ostertagia circumcincta* infective larvae per week (week 1-12). From week 5, both groups received oaten chaff; in addition, the canola group received 33% canola meal pellets (65% canola meal, 24% lupins, 10% oats and 1%  $\text{Ca}(\text{OH})_2$ ; 57% protection) and the lupin group received 30% lupins (35% protection; Hume 1974) (week 5-12). The two diets were isonitrogenous. Faecal egg counts (FEC) were monitored weekly, commencing week 3.

Peak FEC did not differ between groups but declined more rapidly in the lambs being fed protected protein than the lupin fed group (Figure 1.). The lupin group produced significantly more eggs than the canola meal group at the termination of the experiment (week 12;  $P<0.05$ ); this difference tended towards significance from week 9 ( $P<0.10$ ). The rapid decline in FEC in the canola meal fed animals may indicate earlier or enhanced development of immunity.

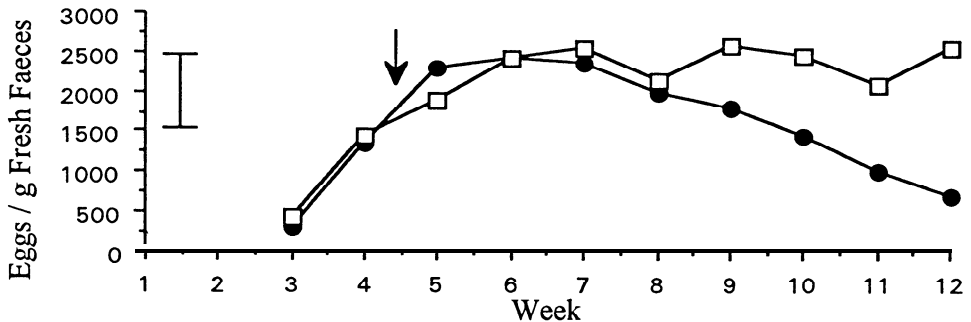


Figure 1. Mean FEC of sheep continuously infected with nematode worms. From week 5 (arrow) animals were fed a canola meal (circles) or lupin diet (squares). SED indicated by bar.

The decrease in FEC in the canola meal group was accompanied by a 14% increase in voluntary feed intake in the final 2 weeks of the experiment ( $P<0.05$ ), providing further evidence of the early development of immunity. The data suggest that the increased supply of protein at the small intestine resulted in a more rapid and effective immune response to nematode infection in the canola meal group than the lupin group. This supports previous results which have demonstrated an association between the level of dietary protein and the ability of young sheep to develop resistance (Abbott *et al.* 1988; van Houtert *et al.* 1995). Canola meal has the potential to enhance the development of immunity and improve production in young animals challenged with anthelmintic resistant nematodes.

ABBOTT, E.M., PARKINS, J.J. and HOLMES, P.H. (1988). *Res. Vet. Sci.* **45**: 41-9.

BOWN, M.D., POPPI, D.P. and SYKES, A.R. (1991). *Aust. J. Agric. Res.* **42**: 253-67.

HUME, I.D. (1974). *Aust. J. Agric. Res.* **25**: 155-65.

VAN HOUTERT, M.F.J., BARGER, I.A., STEEL, J.W., WINDON, R.G. and EMERY, D.L. (1995). *Vet. Parasitol.* **56**: 163-80.