

Strategic grazing of selenium top-dressed pasture as a means of selenium supplementation for sheep

A.K. Metherell, J.L. Owens and C.G. Mackintosh

Invermay Agricultural Research Centre, MAE, Mosgiel, New Zealand

Selenium deficiency can be an important limitation to livestock production in New Zealand and in localised areas throughout Australia. Responses in Australia have been associated with improved pastures in the higher rainfall areas. In New Zealand until recently, direct administration of selenium compounds either orally or by injection was the only allowable method of selenium supplementation. In 1982 regulations were gazetted allowing the application of selenium to pasture either alone or mixed with fertiliser, as pellets containing 1% Se as sodium selenate, at a rate not exceeding 1 kg of pellets per hectare. This recommendation for selenium topdressing had been demonstrated to be a safe and effective method of preventing selenium deficiency for 12 months in all grazing stock (1). However the complete coverage of the property by selenium topdressing is a relatively expensive method of controlling selenium deficiency where stocking rates are low. Strategic treatment of part of a farm can reduce costs. This paper reports on a comparison between the strategic use of selenium topdressing, conventional oral dosing, and a slow release injection.

Methods

Comparisons were made between groups of c. 40 Merino ewes and their lambs grazing extremely selenium deficient pastures (3-17 ppb Se) at Tara Hills Research Station in North Otago, N.Z. Treatments were (1) conventional oral dosing of ewes, pre-mating and pre-lambing, and of lambs at tailing and weaning; (2) injection of ewes with a paste containing barium selenate prior to mating; (3) and (4) grazing of recently selenium topdressed pasture (c. 600 ppb Se in herbage) for 4 or 8 weeks during the flushing and mating period; and (5) control with no selenium supplementation. Lambs in treatments (2), (3), (4) and (5) received no selenium supplementation.

Results and Discussion

All selenium treatments resulted in reduced ewe barrenness, control of white muscle disease, reduced lamb mortality and increased lamb growth rates (Table 1).

Table 1: The effect of selenium treatments on animal production

	Lambs tailed per ewe mated %	Ewes barren %	Lamb Mortality %	Weaning weight (kg)
1. Oral	98	8	19	17
2. Barium selenate injection	123	5	2	18
3. Topdressing - 4 wks grazing	115	0	8	17
4. Topdressing - 8 wks grazing	120	7	8	18
5. Control	19	28	77	9

The results demonstrate that the grazing of recently selenium topdressed pasture for at least one month during flushing and mating will increase the selenium status of ewes sufficiently to prevent selenium-responsive embryonic mortality and the carryover effect will prevent white muscle disease in lambs. In the spring the lambs should be dosed with selenium to prevent post-weaning selenium-responsive ill-thrift. This strategy is at least as effective as conventional oral dosing of ewes and lambs.

1. Watkinson, J.H. 1983. N.Z. Veterinary Journal 31, 78-85.