

**NEMATODE PARASITISM, DIARRHOEA AND
PRODUCTIVITY IN MERINO WEANERS
ON THE NEW ENGLAND TABLELANDS.**

by

**JOHN MACFARLANE
DISTRICT VETERINARIAN
ARMIDALE RURAL LANDS PROTECTION BOARD**

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Supervisors: Dr G D Gray
Mr I A Barger (External)

DECLARATION

I declare that no part of this thesis has been submitted for any degree or diploma, or is currently being presented for any other degree or diploma.

I certify that to the best of my knowledge this thesis contains no material previously published or written by any other person, except where reference is given to that author by direct credit in text or bibliography.

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SUMMARY

This thesis was initiated by ongoing field work and trials that developed from routine field veterinary investigations; these had indicated that gastrointestinal nematode parasitism was a major problem in Merino weaners on the New England Tablelands. This thesis includes a review of the relevant literature and descriptions of a survey and trials to investigate this subject further.

The published literature on gastrointestinal nematode parasites, diarrhoea in Merino weaners of particular relevance to the New England Tablelands is reviewed. This includes information on the species of interest and their impact on productivity. A farm survey was conducted to determine how much of a problem internal parasites and diarrhoea were perceived to be by sheep farmers. It did not include any on farm inspections, work on sheep, analysis of sheep production or financial records.

On-farm investigations were undertaken, involving Merino ewes from weaning until joining (generally covering the age 4 to 18 months), and includes their first winter period. This winter period has always been considered the most difficult time for Merinos in the New England Tablelands and has been associated with ongoing nematode parasite problems, scouring and illthrift, which often times are reflected in overall flock internal parasite burdens and reduced productivity. Being on-farm trials, sheep were under field (that is, non-control conditions) and seasonal condition varied from almost entirely drought declared through to above-average rainfall. Many other epidemiological factors were operating to affect both growth rates and parasite burdens and at best only trends could be established. In general, it was concluded that if sheep went into winter at a suitable body weight, did not suffer any major set backs and were not unduly stressed, then reasonable parasite control could be achieved, which meant weaners could be maintained over this period without parasites becoming a problem. Diarrhoea was determined to be a separate issue and was not specifically pursued further.

A specific trial was performed on Merino sheep from weaning age (4 months) in summer through their first winter period and into the late spring, by which time, seasonal conditions are favourable and sheep have matured. Two groups were compared. One group was maintained at a body weight that the field observations suggested would allow sheep to handle conditions over this period without undue productivity effects. The other group was maintained at a weight field observations had suggested that is minimal for sheep to survive this period. For this experiment, a weight difference of 5 kg was maintained. This was controlled using a computer model as a guide for the supplementation of by-pass protein pellets required to maintain the specific weight difference. Short-term effects indicated low weight sheep; that is, non-supplemented sheep, suffered from increased parasite burdens and consequences thereof, while long-term measurements indicated weight and productivity affects were not compensated for; that is, specifically low-weight sheep always had a significantly lower body weight and lower fleece weight. These long-term effects are consistent with observations from countries where similar nutritional restrictions occur and are found both in Australia and other countries.

A short-term field trial was performed in which both nutrition and genotype; that is, sheep selected for parasite resistance, were compared. In this case, it was concluded that feeding increased the ability of random-bred sheep to handle parasites at the end of the period of feeding, and that the genotype selected for parasite resistance did likewise. The combined effect suggested that the resistant-bred sheep maintained this effect on the lower plane of nutrition.

The general discussion makes the point that nutritional status is most critical during winter in the New England Tablelands, and this effect is most pronounced in Merino weaners. The long-term effects are to compromise internal parasite control programs on the farm through the development of anthelmintic resistance, and to cause long-term production effects in the flock (specifically lower fleece weights and lowered fertility).

These trials demonstrate that attention to nutrition in Merino weaners through the adoption of nutritional recommendations along with on-farm monitoring, can ensure good parasite control and improve weaner production. They also demonstrate the potential for breeding programs to improve parasite resistance and play a major role in Merino production, when used in association with nutrition and worm control programs. Together, these factors can be utilised to put into place a full integrated program that allows for the maximum production potential to be realised.