

# internal parasites in sheep

## management issues for merinos

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*THIS LEAFLET IS DESIGNED TO FIT IN YOUR MERINO INC. FOLDER*

## key points

### ISSUES

- It has been wrongly assumed that that internal parasites are only of minor importance in much of the high country where Merinos are farmed.
- Merinos seem to be more prone to, and develop more serious symptoms of internal parasites than other breeds of sheep.
- Drench resistance (the ability of worms to survive doses of drench that would normally kill them) is a serious problem for parasite control.
- Use of persistent drenches or capsules leads to faster onset of drench resistance.
- New drench types are unlikely to become available for at least 5 years.
- The interaction between parasites, the environment, sheep, and management decisions is complex.

### MANAGEMENT

- The aim is not to eradicate worms, but to reduce the adverse effects in practical and economic ways.
- All Merino farms should have an integrated parasite control programme which includes:
  - Knowing the annual cycle of worms on your pastures
  - Using strategic drenching to kill adult worms in sheep
  - Using grazing management strategies to provide clean or 'low risk' pastures for the most susceptible sheep.
- If drench resistance is suspected contact a veterinarian about drench strategies.
- Routine drenching of adult sheep is no longer recommended, as it can lead to drench resistant worms. Good nutrition and good body condition are the best ways to reduce worm problems at lambing.

## INTRODUCTION

Internal parasites have been the biggest animal health problem on New Zealand sheep and beef farms for more than 100 years. They include roundworms, tapeworms and flukes, but roundworms are the major cause of serious parasitism in New Zealand. The most important of the 29 roundworm species present in New Zealand are *Nematodirus*, *Trichostrongylus*, *Haemonchus*, *Ostertagia* and *Cooperia*. Many of these are a problem in merino flocks in New Zealand.

Internal parasites cost farmers \$300 million a year in lost sheep production and drench use, while about \$50 million a year is spent on drenches for cattle. In addition, worm resistance to drenches costs about \$20 million a year and is increasing rapidly. In the past, drenches have been the main roundworm control tool available to farmers. However, in the face of increasing drench resistance and the need to minimise drench residues in animal products, new parasite control strategies are called for. Farmers are now advised to adopt integrated roundworm control programmes for their farms.

It has been wrongly assumed that in many of the Merino farming areas that internal parasites were only of minor importance because the harsh climate resulted in low survival of the eggs and larvae on pasture. Recent work at Lincoln showed that both survive for much longer than previously thought.

## PRINCIPLES OF WORM CONTROL

Roundworm populations can be monitored through faecal egg counts (FECs). These are a good guide to worm larvae numbers on pasture, where they reach a major peak in autumn, and a variable or minor peak in spring. Over 90% of the internal parasite population exists outside the host animal in faeces, on the pasture, or in the soil. The source of the autumn peak is contamination by lambs, while the spring peak is from breeding ewes.

Adult ewes are generally immune to worms, but under stress this can break down. This often occurs around lambing when, for about four weeks, there is a rise in FECs and pasture contamination. This is due to the additional nutrient demand in late pregnancy and early lactation and is most obvious in ewes with multiples or ewes in poor condition. A similar rise may also occur earlier in pregnancy, if the animals are underfed or stressed. Merinos seem to have a more serious breakdown in immunity to round worms than other breeds. It may also last for longer in Merinos. Ewes that are resistant to worms have a very small or nil rise in FECs around lambing.

Better nutrition, especially protein, improves the immune response and drastically reduces the rise in FECs in ewes around lambing. Because of the importance of good levels of feeding, including feed quality and protein levels to help ewes maintain a good immune response to worms, it is questionable whether Merinos on low quality feed during winter, especially on tussock country, can ever get sufficient quality feed.

Lambs develop immunity to roundworms by 8-10 months of age, but to maintain this immunity, they need larval challenges from time to time.

## INTEGRATED CONTROL PROGRAMMES

It is recommended that each farm has an integrated roundworm control programme. This will help reduce reliance on drenches and help delay the onset of drench resistance.

As a starting point, you need to know the drench resistance status of your farm – in other words, which worm species are resistant to which drench families. Your vet can organise the necessary tests, and – on the basis of the results – advise you on which drenches and drench families to use. In addition to preventative drenching, based on regular FECs, an integrated roundworm control programme should be based on the following:

- Use pasture species (such as chicory and legumes) that reduce parasite survival on the pasture or reduce larval migration up the plant, especially after weaning.

- Use plants containing condensed tannins (such as Lotus or Sulla). These tannins protect dietary protein from rumen degradation and also may have a direct anthelmintic<sup>1</sup> effect.
- Use safer pasture from newly sown grass or hay/silage regrowth (although there can be some risk with the latter), or forage crops. These should be ready for the lambs to go on to immediately after weaning.
- Use cattle or deer to graze areas in preparation for weaned lambs, as worms rarely transmit from one species to the other. They also 'vacuum up' infective larvae from the pasture.
- Ideally, weaned lambs should not regraze areas that were grazed by the ewes and lambs during lactation. Unless 30–50 percent of stock units on the farm are cattle or deer, there is unlikely to be sufficient of this type of safe area available and other clean pasture or crop options will be needed.

## DRENCHING ADULT EWES

To generalise is risky, as every flock is different and each farmer needs to assess whether or not to drench. Because adult ewes are normally immune to worms, drenching should not be necessary. However there may be situations where it is needed, particularly in seasons when feed is short. Poorly conditioned ewes may respond to drenching, especially if they are bearing or suckling multiples. Decisions should be made on the basis of FECs, ewe body weights and condition, feed available, scouring, grazing management, drench resistance knowledge etc.

Drenching results in cleaner pastures, which will in turn improve performance of lambs later in the season, but the trade-off is with the risk of worm resistance. If there are no or few resistant species of worms present then safer pastures should ensue, but if there are worm species present which are resistant to the drench family being used, there will be a quicker and more severe onset of resistance. This is occurring on more and more farms. It creates a dilemma. Do you drench for short-term economic gain, when it puts at risk the long-term drench resistance status of your farm? Only individual farmers can answer this question, on the basis of the circumstances of their farm. Before doing so, it pays to consult a veterinarian who is armed with up-to-date information about the drench-resistance status of your farm.

Until recently, routine drenching of ewes to prevent the increase in worms around lambing was common practice. Drenches were also used to successfully create areas of 'safe' pasture. This strategy worked, because drench-resistant worms were either absent, or very rare. It is now recognised that the routine use of drenches gives resistant worms a breeding advantage. This can lead to a mono-culture of resistant worms in the sheep and on the pasture. Because resistance is 'forever', routine drenching of ewes is now seen as undesirable. Use of persistent drenches or capsules in adult ewes is no longer recommended, as these give resistant worms a breeding advantage, and lead to faster onset of drench resistance.

## DRENCHING LAMBS

A successful parasite programme combines the effective use of drenches, grazing management and FEC monitoring. The aim is to prevent sheep being challenged by a significant parasite threat. Drenching is not a substitute for good feeding.

With the exception of areas where *Nematodirus* is prevalent, such as in Southland, there is generally no need to drench lambs before weaning. Again, FECs are the best indicator of whether to drench or not.

Current drenching recommendations include a preventative drenching regime post-weaning as part of an integrated management programme. This is generally a series of five or six drenches commencing at weaning. The drenching interval should be no more than 28 days and certainly not less than 21 days. Capsules can replace regular treatments but meat withholding periods for slaughter should be strictly observed. Drenching for tapeworm control is not generally recommended as there is little proven

1. Anthelmintic: A chemical or agent that removes helminths (worms). Also called a drench

economic advantage. Any additional drenching after the basic preventative programme should be based on factors such as FEC, feed availability and lamb growth rates.

## **BREEDING SHEEP FOR WORM RESISTANCE**

There are two approaches to breeding sheep to combat internal parasitism in New Zealand – breeding for resistance and breeding for resilience. Resistant sheep are more immune and prevent worm larvae establishing, while resilience means sheep can tolerate a worm burden and still have good levels of production. The NZ research has been with cross-bred sheep. Breeding for resistance or low FECs has a higher heritability (approx 0.2 to 0.3) while resilience has a heritability of about 0.1 and genetic progress is slower.

Resistant animals may not be the most productive, and selection for resistance alone has some undesirable characteristics such as increased dagginess and decreased fleece weight. The disadvantage of selecting for resilience is that pasture contamination can result in worm infestation in the non-resilient animals. The animal selection policy should include productive characteristics as well as low FEC.

In the NZ studies there has been no correlation between worm resistance and resilience. This is in contrast to the Australian work with Merinos where they have found a positive correlation between the two traits. CSIRO, in their Nemesis project, has been selecting Merinos for worm resistance for over 20 years and is now working with a number of ram breeders.

To breed for resistance, select rams on the basis of on a combined breeding index that includes low FECs (about 20% of the index) as well as productive traits. Sheep Improvement Limited provides this information for animals in its database.

Selection for resistance will be greatly enhanced when gene markers have been identified and the service is available to industry. While the NZ effort is concentrating on dual-purpose breeds, CSIRO in Australia has made considerable progress in this area with Merinos, using the “Golden Ram” flock founded in the 1980s.

## **CURRENT RESEARCH**

Biological control (using fungi) and use of vaccines are currently being experimented with in NZ and overseas. The former option is close to having a commercial product.

Other research, which is longer term, includes reducing the animal’s immune response (most damage is from the animal’s immune system reacting to the worm), altering gene expression, and use of natural control compounds

## **FURTHER INFORMATION**

The following reports are available from Merino Inc:

“Internal Parasite Report. A report to Merino NZ Inc.” by Peter Rattray October 2003

“Merino 100 % Club. Final Report to Wools of New Zealand” by R. Green, R & C. Mulvaney; 1998.

“Parasite Notes” 1998. A NZ Sheep Council & Merial NZ Ltd Publication \$24.95 (This is a practical, user-friendly guide to worm management, including drenching strategies)

Web site:

[www.sheepwormcontrol.com](http://www.sheepwormcontrol.com) – Sustainable Control of Internal Parasites of Sheep – is an Australian Wool Innovation initiative, but much of the material is relevant to NZ.