

Worm treatment failure on Irish sheep farms

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Grazing sheep are naturally exposed to parasitic roundworms that live in the gut and infection can result in chronic disease, ill-thrift and occasionally death. Worm control depends on effective worming products and grazing management. However, an unavoidable result of continuous use of wormers is the development of drug resistant worms. These are worms that can survive a dose of the wormer that would normally kill them.

Left unchecked, worms developing resistance to wormers will lead to one of the biggest challenges facing sheep producers. Treating lambs with products that do not give the desired control is a waste of time and money. It also results in poor performance as the sheep end up carrying a heavy worm burden despite having been treated and you thinking parasites are now covered.

Until 2009, farmers had three "families" of broad spectrum wormers available for treating gut roundworms. These were benzimidazole (white group), levamisole (yellow group), and macrocyclic lactones (clear group e.g. ivermectin, moxidectin, doramectin). After over 25 years, two new families of wormers were launched on the Irish market; in 2010 Novartis Animal Health launched Zolvix which belongs to a new family of wormers called the AADs (orange group).

In 2012, Zoetis launched a new

product called Startect which is a dual active compound combining derquantel which belongs to a new family of drugs, Spiroindoles (purple group), with abamectin (clear group anthelmintic).

These two new families of wormers are prescription-only medicines and if used judiciously afford new opportunities for Irish flock owners to prolong the lifespan of the older families. Research shows that there is wide-scale wormer failure, which has proven to be due to resistance to wormers (anthelmintics) on Irish sheep farms

STAP drench test task

Between 2013 and 2015, the Department of Agriculture, Food and the Marine (DAFM) administered the Sheep Technology Adoption Programme (STAP), with the aim of increasing profitability by encouraging the adoption of best management practices.

One of the options available to STAP participants was to test the efficacy of the anthelmintic treatment (benzimidazole (white group), levamisole (yellow group) or macrocyclic lactone (clear group)).

This was done by means of a drench test which is a modification of the faecal egg count reduction test. Individual faecal samples were collected from the same group of lambs before, and at a defined time after, anthelmintic treatment.

The number of eggs present pre- and post- treatment was subsequently determined in the lab from pooled faecal samples.

An impressive number of drench tests (4,211) were taken by farmers during the three years of the STAP programme. Information on the an-



thelmintic product used was available for 3,771 of these tests; anthelmintics from the benzimidazole group (white drench) were the most popular products (Figure 1).

The efficacy of treatment against gut roundworms known as other trichostrongyles (which excludes *Nematodirus* species) that cause the main problems midseason could be established for 1,446 drench tests and 49% of these tests were considered ineffective (i.e. a reduction of faecal egg count (FEC) \leq 95%).

There was a significant difference among the drug groups in efficacy and Figure 2 provides a summary of the efficacy of each drug group. This pattern is in line with a pilot drench test study carried out on a small number of Teagasc clients' flocks in 2012 (Figure 3).

Drench failure does not necessar-

Table 1: Timeframe for testing the flock post-drenching with wormers from different groups

Wormer group	Number of days post-treatment to resample sheep	
1	Benzimidazole (white group)	10-14 days
2	Levamisole (yellow group)	5-7 days
3	Macrocyclic lactones (clear group)	14-16 days



The Sheep Technology Adoption Programme aimed to increase profitability by encouraging the adoption of best management practices.

Figure 1

Choice of wormer used by farmers for STAP drench test task

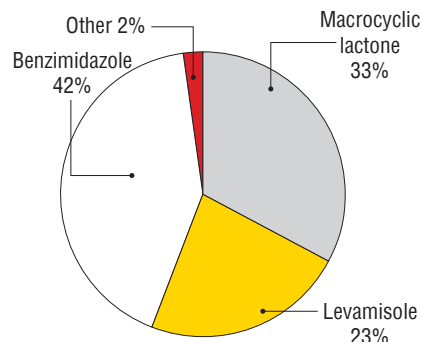


Figure 2

Drench failure observed in STAP participant's flocks 2013-2015

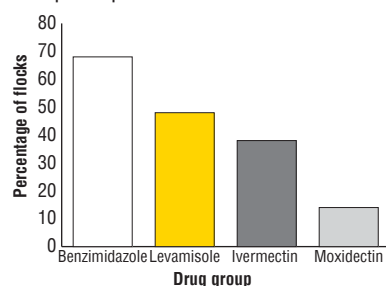
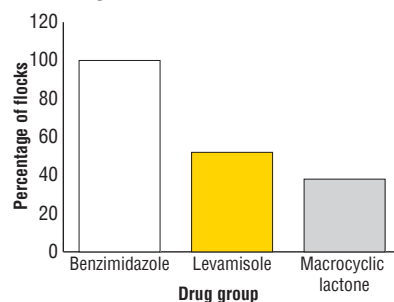


Figure 3

Drench failure observed in Teagasc client's flocks in 2012



ily mean that the worms are resistant. Drench failure could be due to a myriad of other reasons relating to sub-optimal treatment such as use of a faulty dosing gun or administration of the incorrect dose rate.

Unnecessary drenching

More than a quarter of STAP participants (who complied with the drench test instructions) had pre-treatment faecal egg counts below 200 eggs per gramme. In sheep, this indicates a low level of gut parasitism and highlights that many farmers were treating unnecessarily.

The results highlight the merit of using worm egg counts to help inform the correct timing of treatment. So not only are worm egg counts useful in establishing treatment/drench performance, they are useful in guiding when, and who, to treat.

Drench test

So, if like many producers, you are using a wormer that belongs to the three older families, it is important to check that it is still working on your farm. The simplest approach and a good post treatment practice is to determine whether any worms survive after drenching, i.e a drench check.

This involves getting faecal samples from at least 10 lambs at specific times (Table 1) post-treatment and sending them to the lab where they will determine the number of eggs per gramme of faeces (faecal egg count). Should there be eggs present, a more detailed look is warranted to determine the reduction in egg count post treatment.

This requires taking samples pre and post treatment (like in the STAP drench task) to calculate the reduction in the number of eggs observed

post treatment. Samples should be taken from at least 10 lambs that have not been treated in at least six weeks (longer if you have treated with a long-acting wormer).

The length of time that should elapse between drenching and taking the post-treatment dung sample depends on the type of wormer that is used (Table 1). All products must be given in accordance with the manufacturer's recommendations.

Conclusion

Drench tests offer an impartial and cost effective method to test the efficacy of your wormer. Multiple drug resistance is a serious threat. We encourage producers to test the efficacy of the wormer on their flock and, in line with best treatment practices, to use worm egg counts to inform decisions on treatment for worms.