

Is your wormer working?

Anthelmintic resistance is a major challenge for sheep producers

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Anthelmintic (wormer) resistance is one of the biggest challenges facing the sheep industry worldwide. Ireland was far from the first country to experience it but as far back as the early 2000s researchers here could find evidence of resistance to all three anthelmintic classes. In particular, there has been a substantial increase in the level of resistance to the Macrocytic Lactone group which contains Ivermectin, Abamectin, Moxidectin and Doramectin-based products.

Why does this matter? Research carried out in Scotland has shown that once resistance to a particular anthelmintic group develops on a farm, it is permanent and not reversed even if that group of anthelmintics is not used again for many years.

It is particularly concerning that there is an increasing number of farms where two, or all three, of the commonly available anthelmintic classes are no longer effectively doing their job of killing worms in sheep.

Teagasc, as part of a research project looking at anthelmintic resistance in commercial sheep farms, has carried out a number of faecal egg count reduction tests. Samples are collected from individual lambs before, and after, treatment. The pre- and post-treatment sample for each lamb is analysed and generally 15 lambs per anthelmintic class are tested (totalling 30 tests).

Wexford farmer John Kelly took part. John had become concerned when he tested faecal samples from a group of lambs two weeks after dosing and got a positive egg count.

The Kelly farm is a sheep and tillage which runs a flock of approximately 250 mid-season lambing ewes in Ballinabarna, Enniscorthy. Lambing typically begins on 20 February

and continues for five weeks. Sixty ewe lambs are retained each year as replacements with all remaining lambs slaughtered from a grass-based system without any concentrate supplementation.

“Over the last number of years, I was disappointed with our lambs’ performance at grass and became suspicious that our wormer was not as effective as it should be,” says John. Lambs were being managed to a high level in a paddock grazing system, typically being moved to a fresh paddock of high-quality ryegrass/white clover mix every three days.

Drench tests

“We performed a couple of drench tests whereby a faecal sample was sent to the lab to establish the level of worm burden and we submitted a faecal sample again seven or 14 days later depending on the product used to establish how well that product had worked.”

These tests were completed on specific wormers, and indicated that the wormer tested was not achieving anywhere near the required 95% kill of worms present to be considered effective.

This prompted John to join the trial on anthelmintic resistance on sheep farms carried out in 2019 by Orla Keane of Teagasc, Grange.

The results of a full faecal egg count reduction test on John’s farm showed that:

- Benzimidazoles (group one (BZ) or white drenches) were 100% ineffec-

tive. In fact, the egg count continued to rise in the lambs that were being treated with the product.

- Levamisole (group two (LV) or yellow drenches) were still very effective (96% kill rate) and will form the backbone of his treatment plan.

- Macrocytic Lactones (group three (ML) or clear drenches) were no longer fully effective. On this farm two ML products were tested. The Ivermectin had a 68% kill rate. To be deemed effective the drug should kill at least 95% of the worms. Moxidectin had a 93% kill rate – again, not fully effective, but still a useful product on this farm which is deemed to have resistance to two of the anthelmintic groups.

So what causes resistance to develop? Over the 60 years since sheep farmers started using anthelmintics to control internal parasites, much of the advice targeted at maximising animal performance.

On intensive sheep farms, farmers were told to dose lambs every three to four weeks. After dosing, the sheep were moved to clean pasture to prevent or delay reinfection. Dosing ewes before lambing, to reduce the amount of worm eggs that they would subsequently put out on the pasture, was also recommended.

All good advice if you didn’t have to worry about the anthelmintic resistance developing. People didn’t consider anthelmintic resistance until much later on. So was this advice wrong? Well, with the benefit of hindsight, yes it was.

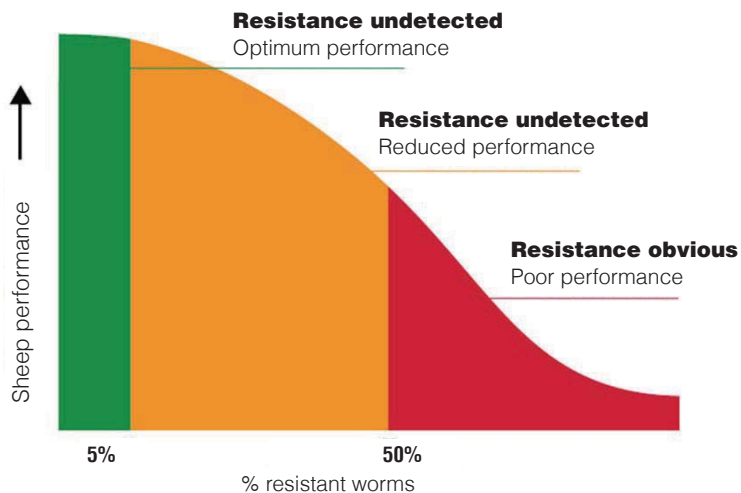
Anthelmintic resistance is the ability of the parasite to survive a treatment that would normally kill it. In every population of stomach worms there will be a small number of worms that are resistant to anthelmintics (even newly developed products). The speed at which that genetic resistance grows is determined by:

1. How often the product is used – every time we use the product the resistant worms have a competitive advantage. Resistant worms survive and pass their eggs out onto the pasture. Over time more and more of the eggs on the pasture are from resistant worms.

2. If we misuse the product by under-dosing or by using incorrectly calibrated equipment that is not delivering the quantity we think it is – we encourage the development of resistance.

3. If we continue to use products that are no longer fully effective.

In general, farmers will only start to see poor animal performance post-treatment when products are less than 80% effective. At that stage, it can be too late to try to implement strategies to maintain the efficacy of these anthelmintic categories. Continuing to



use products which are no longer effectively killing the parasites results in sub-optimal animal performance.

In order to help sheep farmers to establish the anthelmintic resistance status of their farms and to take steps to combat the speed at which anthelmintic resistance develops, Teagasc – in consultation with other industry stakeholders – has developed a four-step action plan as a starting point for everyone in the industry.

See <https://www.teagasc.ie/media/website/publications/2020/Control-of-Stomach-Worms-Flyer.pdf>



Read the Four Actions PDF online: <http://bit.ly/wormers>




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So, back to John Kelly – what is his plan?

The results of the tests showed that on his farm:

- White drenches (Class 1 BZ) are 0% effective.
- Yellow drenches (Class 2 LV) are 96% effective.
- Clear drenches (Class 3 ML) the Ivermectin-based products are 68% effective.
- The Moxidectin-based product was 93% effective.
- Levamisole is achieving a parasite kill that is greater than the required 95%.

The following is John's strategy to maintain the efficacy of the current anthelmintic class and reduce his dependence on the two new categories of POM wormers (Zolvix and Startect). These are very expensive products – five to 20 times more expensive than the over-the-counter products in the case of Zolvix:

- Only use a Benzimidazole (white drench) for nematodirus. Despite these products being ineffective against the main stomach worms, they are still effective against nematodirus which is the first parasite that young lambs encounter in spring.
- Do not treat adult sheep (over one year old) with an anthelmintic unless there is a need based on laboratory evidence and veterinary advice. Do not use anthelmintics to treat for



John Kelly says dung samples must be very fresh and handled and stored carefully to ensure an accurate faecal egg-count result.



Key messages

Every sheep farmer must recognise the threat that anthelmintic resistance poses to his/her flock. It is here now and is costing farmers lots of money in terms of lost animal performance from using products that are not working effectively. As outlined in the action plan:

- Only use a white drench (BZ class one) for the treatment of nematodirus in the spring time (usually April and May)
- Never dose adult ewes for stomach worms – unless there is a demonstrated need based on veterinary advice
- Carry out a drench test on your farm to find out what products are still working.
- Always treat bought in stock or stock coming from another holding with a quarantine drench to prevent bringing resistant parasites on to your farm.

sheep scab (use dipping) and do not use combined flukicide/wormers (use a flukicide alone if required).

If adult sheep need routine dosing consult your vet or agricultural advisor as there may be an underlying problem that is making them more susceptible to worms.

- After weaning, ensure that ewes and lambs graze over the same pasture. Use a leader-follower system where the lambs graze ahead of the ewes.
- From mid-May onwards, only treat lambs for worms based on need demonstrated by a faecal egg count.
- Quarantine-drench all bought-in sheep with Zolvix plus either Levamisole or ivermectin or Startect plus Levamisole and house them for 48 hours to allow any resistant eggs already laid to pass out. Avoid spreading this dung on sheep ground. When turning out these sheep turn them out on to pasture that has had sheep grazing on it recently
- Never dose and move to clean pasture (a reseed or aftergrass/forage crop). Dose (minimum of five days) before moving or else wait (minimum of five days) after moving before dosing. Only treat (minimum of five days) after the movement occurs if using a Moxidectin-based product

due to the persistent activity of this product.

- Test the efficacy of Levamisole every two years using a drench test.



We are now constantly monitoring lamb worm burdens through faecal sampling

- Limit the use of Moxidectin due to its persistent activity and the fact that it is already not achieving a 95% kill.
- Use a break dose (Zolvix or Startect) once per year in late summer and when the egg count is sufficiently high (>500 epg)

“We are now constantly monitoring lamb worm burdens through faecal sampling,” concludes John Kelly.

“I do it every two weeks during the grazing season once treatment for nematodirus ceases. The level of worm burden in the faecal sample dictates whether a dose is required and has now replaced routine dosing based on dates.”