

Consulting for preventative parasite control – 2022 Parasite Control TASAH results

Just under 400 large animal practitioners took part in the Parasite Control TASAH programme last year. With 16,000 herd and flock consults completed nationwide, this programme has provided a valuable source of information on antiparasitic practices on Irish farms. Natascha Meunier BVSc MSc PhD Dip.ECVPH, Programme Manager at Animal Health Ireland, summarises the findings of the programme and how this relates to sustainable parasite control



The Targeted Advisory Service on Animal Health (TASAH) programmes, managed by Animal Health Ireland on behalf of DAFM, offer an opportunity for on-farm advisory visits relating to a number of health conditions. The Parasite Control TASAH allowed for the training of over 600 veterinary practitioners to deliver the service which required them to review the farm parasite control practices and carry out two faecal egg counts for roundworms for each participating farmer. Based on the review, veterinary practitioners offered up to three recommendations for improving parasite control practices. Both sheep and cattle farmers were eligible for this voluntary programme, which was delivered at no cost to the farmer. The programme has continued into 2023 to provide an opportunity for new or repeated visits to farms but will be closing on October 31, 2023.

Anthelmintic resistance is an inevitable consequence of selection pressure under chemical treatments and has become a major concern for the long-term sustainability of intensive livestock farming. A recent European study¹ estimated costs of anthelmintic resistant gastrointestinal

nematodes, resulting from lost productivity and the cost of partially ineffective anthelmintic drugs, at €8.4 million for Ireland, in the context of an annual €236.8 million total cost of helminths to the Irish industry.

With resistance levels increasing, it would be unwise to not take preventative measures and the onus has been placed on veterinary practitioners through the VCI code of conduct for 'Acting prudently to ensure the responsible use of medicinal products in animals'². Veterinarians are well placed to help identify a resistance problem on the farm or the factors that might be increasing the risk of this developing. They can further advise where incorrect products are being used for targeted parasites, inform about which parasites might be problematic on the farm, optimise dosing and handling, and advise on treatments and drug choice, monitoring, testing, and quarantine protocols.

The three main problem parasites reported as part of the TASAH programme on cattle farms were: lungworm, stomach and gutworms, and liver fluke. Additionally, re-infection syndrome was reportedly diagnosed on 4.8 per cent of cattle

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farms (10.5 per cent of dairy systems) in the last 12 months. In sheep flocks, the top three reported problem parasites were: stomach and gutworms, flystrike and liver fluke. One of the key aspects of the TASAH was the recommendations made to the farmer by the veterinary practitioner. This advice was summarised for a 20 per cent sample of the participating farms and is described below along with relevant findings from all of the 16,116 reviews completed as part of the TASAH consult.

TREATMENT RECOMMENDATIONS

As would be expected for veterinary practitioners, treatment advice relating to the choice of medicine, timing and frequency of the treatments, was frequently given as part of the TASAH (47 per cent of cattle farms and 39 per cent of sheep farms). Macrocyclic lactones (ML) were the most frequently used class of broad-spectrum anthelmintics on cattle farms in the last 12 months for gutworms, being used on twice as many farms as benzimidazoles (BZ). On sheep farms, both BZ and ML were used equally frequently for gutworms. 64 per cent of sheep farms specifically used BZ against nematodirus.

Only 6 per cent of farms did not treat for gutworms or lungworms in calves in the last 12 months and 14 per cent did not treat adults, with higher treatment frequencies in younger animals. 17 per cent of herds did not treat adult cattle for liver fluke which would align with the 11 per cent of herds that do not have evidence of liver fluke at slaughter as part of the Beef HealthCheck programme³. For lambs, only 2 per cent of farms did not treat for gutworms and 13 per cent of farms did not treat adults. Best practice would be to dose adults only when needed because adult livestock usually develop immunity to gutworms and don't require these treatments; the low percentage of farms leaving adults untreated might be an area to focus on.

The main reasons given for gutworm treatments were a set date or age (37 per cent sheep, 42 per cent cattle) or a set interval (36 per cent, 34 per cent), and clinical signs (39 per cent, 33 per cent). The presence of clinical signs are an obvious indicator to treat but may come too late to prevent production losses. Set dosing on the other hand may be too rigid and result in unnecessary treatments. Ideally, we want to move to adaptable, evidence-based treatment plans that rely on indicators such as production and growth performance, testing, weather conditions and risk history.

Liver fluke treatments were reported as not optimally timed on 18 per cent of cattle farms and 14 per cent of sheep farms. The majority of flukicides are only effective against the adult stages of the liver fluke, so the choice and timing of products should suit the expected life stage present.

Advice was given in varying detail to specifically rotate anthelmintics on 30 and 31 per cent of cattle and sheep farms, respectively. While rotation of anthelmintics is understandable to avoid frequent use of the same product, a better approach is to first test for treatment efficacy before changing, or to strategically use an active ingredient targeted at a worm species in that season, e.g., BZ for nematodirus as the early

season dose in lambs followed by levamisole (LV) or ML as a mid-season dose, ML in calves at housing to target Type II ostertagiasis or a BZ that also targets liver fluke. Rotation of the anthelmintic class might also move a farmer away from their preferred method of application (pour-ons for cattle), making dosing more labour intensive.

PASTURE OR GRAZING ADVICE

The general objective of grazing management for intestinal parasite control is to reduce the contact between the infective larval stages and the susceptible hosts⁴, thereby reducing the need for anthelmintics. This advice is often in direct competition with the optimal production use of the grass and relies on management input. At 13 per cent of farms, this was the least frequent category of advice offered by veterinary practitioners. However, grassland management has the potential to have large impacts on the requirement for anthelmintic usage. Where possible, co-grazing, leader-follower systems, alternating calf pastures annually and moving high-risk animals to low contamination pastures could be considered along with an appropriate reduction in treatments. These are not necessarily difficult to implement through grazing planning and are cost-effective.

ACCURATE DOSING AND HANDLING

Reduced effectiveness (treatment failure) does not necessarily equate to anthelmintic resistance being present and an initial step would be to review treatment protocols and procedures where anthelmintic resistance is suspected. Reviewing the treatment process may be beneficial even if no treatment failure is expected, as these are often straightforward to implement and will ensure adequate dosing.

Calibrating dosing equipment, inaccurate weight estimation, skin contact and absorption of pour-ons, and licking behaviour by untreated animals in a group can all result in partial dosing⁵. 30 per cent of cattle farmers and 26 per cent of sheep farmers calculated dosage rates based on the average weight of the group, which is usually estimated. This runs the risk of under-dosing and instead, dosing based on the heaviest animal in a similarly-sized group should be encouraged. Similarly, there is a risk of administering the wrong dosage, if dosing equipment is not regularly checked and calibrated, something 43 per cent (sheep) and 47 per cent (cattle) of farmers admitted to never doing.

TESTING AND MONITORING

Faecal egg count testing (47 per cent sheep, 53 per cent cattle) and more general testing and monitoring advice (31 per cent sheep, 33 per cent cattle) were commonly given to farmers. This follows, as only 32-34 per cent of farmers had routinely used parasite indicators in the last 12 months, although the majority of farmers (75-82 per cent) were monitoring performance routinely, which is recommended to be used alongside the parasite indicators, weather conditions and historical farm risk.

A threshold of 200epg two months after turnout for first

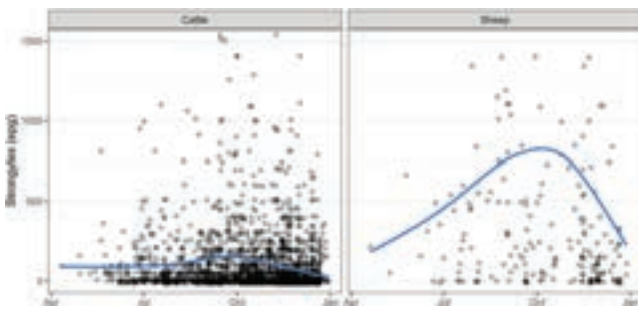


Figure 1: TASAH submitted FEC results before treatment when testing as part of a drench test. The blue regression line can be interpreted as the average and points are staggered to allow for visualisation.

season grazing calves has been associated with a high risk of the development of parasitic gastroenteritis⁶. Outside of this group, the FEC has some limitations to usefulness and interpretation in cattle, but FEC remains the most commonly used test for monitoring infection patterns and provides an indication of larval pasture burden. The reader is recommended the review by Charlier et al. (2022)⁷ for details on alternative testing available for cattle helminths. Higher thresholds are recommended when interpreting FECs in sheep and this is reflected in the generally higher FEC results seen in sheep flocks as part of the TASAH (Figure 1). It should be noted that the majority of samples had low egg counts, with 89 per cent of the FECs for cattle below 200epg, and 75 per cent of the sheep samples under 500epg. Figure 1 also illustrates the seasonality of the increase in worm burden over the grazing season.

Pooled drench testing indicating a treatment failure should be followed up more closely with a rigorous faecal egg count reduction test, taking care to ensure the correct administration of the products and testing protocols.

12 per cent of cattle farmers and 28 per cent of sheep farmers reported that antiparasitics were not fully effective but few farms had undergone any formal faecal egg count reduction testing (3 per cent cattle, 7 per cent sheep) or drench testing (2 per cent cattle, 10 per cent sheep) in the last three years. In cases of suspected resistance, repeated testing is advised after investigating possible causes of treatment failure, as a number of factors can influence the outcomes of these tests. Faecal egg count reduction testing is affected by factors influencing the absorption and bioavailability of the drugs, factors affecting parasite egg production and number, sampling procedures, and sensitivity and accuracy of the tests⁵. For example, the seasonal variability of the worm species composition can influence the number of eggs produced depending on the fecundity of the dominant species present. The timing of the sampling can therefore mask a natural increase or drop in egg counts by season. Increased faecal volume (diarrhoea) can give false low egg counts and also decrease absorption time of drugs in the gut, reducing apparent effectiveness. Gut health and feed intake can influence absorption, and liver function will influence the bioavailability of certain drugs. While there are limitations, these tests remain readily accessible, although the results

require some careful interpretation in the context of the parasite epidemiology and the administration of the testing protocol. If antiparasitic resistance is diagnosed, this should be reported to the HPRA to aid in the national picture of drug susceptibility (www.hpra.ie).

CREATING SOURCES OF REFUGIA

18 per cent of cattle and 28 per cent of sheep recommendations given focused on creating refugia, which are parasite populations unexposed to the selection pressure of drug treatments. Advice was often to only treat certain animals (targeted selective treatments) or treat groups (targeted treatments) based on indicators that delay dosing for those that do not require treatments, for example, not treating adult animals. There is as yet no specific guidance available in this area, e.g., how many animals to leave untreated or for how long to delay treatments to allow building of a susceptible population of helminths, and success depends on the amount of worm population mixing, animal tolerance of the worm burdens and environmental conditions⁴. Treatment frequency should ideally be decreased during periods of low environmental refugia, i.e., drought conditions. It is important to note that delaying treatments or leaving animals untreated can result in risk which needs to be carefully managed with further close monitoring advice or follow-up testing to prevent production losses, especially for lung worm and pasture contamination in high-production systems.

BIOSECURITY

Quarantine advice, modifying existing practices or giving full protocols, was recommended on 32 per cent of sheep farms and 15 per cent of cattle farms. Less than a third of cattle farmers and less than half of sheep farmers routinely applied a quarantine protocol. This allows for the real risk of buying in resistant parasites, among other infections, when over two-thirds of farmers introduced new animals over the last year. The current best practice would advise treatment of brought-in animals, a holding period of a minimum 48 hours and then release onto recently-grazed, 'contaminated' pastures that would allow dilution of any potentially resistant larvae from the new animals.

EVALUATION OF THE PROGRAMME BY FARMERS

The 2022 Parasite Control TASAH programme was evaluated by means of a farmer survey from which we received 94 responses with largely positive feedback. 82 per cent of farmer respondents indicated that the TASAH consult provided them with the opportunity to speak with their veterinary practitioner about a new topic, this being the main objective of the TASAH consult, and most intended to consult with their vet about parasite control in the future. Additionally, the majority of farmers indicated that the consult taught them something new about resistance, increased their knowledge on parasite control, and expressed the intention to test the efficacy of the anthelmintics used on farm and to use FECs in the future.

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Confirmation of resistance on farm, knowledge and awareness of parasite control practices, and risk perception, have been identified as important factors for the uptake of sustainable control practices by Scottish sheep farmers, in addition to the importance and influence of veterinarians⁸. The Parasite Control TASAH therefore supports the interactions between veterinarians and their farmers to make improvements in sustainable worm control practices, although encouraging changes in attitude and behaviour can take a long time to see results. Practical advice that is clear, cheap and easy to implement is more likely to be followed and is the best starting point to motivate the shift to sustainable control.

CONCLUSION

The long-term sustainability of antiparasitics relies on the implementation of principles of best practice. These are holistic by nature, with a farmer-centred approach, and no single method will resolve the issue of resistance. The principles involve developing a health plan, reducing dependence on antiparasitic drugs, testing and monitoring, treating appropriately and only when needed, and implementing good biosecurity practices. The goal is to identify resistance early so that steps can be taken to try to prolong the effectiveness of the medicines. Sustainable parasite control also encompasses protection of the environment; survival of environmental nematodes, dung beetles and other fauna is not highlighted frequently, even though many antiparasitics are toxic to these secondary targets. Incremental changes over time can shift the general attitude away from using only chemotherapeutics, a mainstay since the arrival of these effective classes of medicines, and veterinarians remain a valuable source of guidance to farmers in this arena.

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Reader Questions and Answers

1 WHICH OF THE FOLLOWING ARE NOT PRINCIPLES OF SUSTAINABLE PARASITE CONTROL?

- A. Reduce dependence on antiparasitic drugs
- B. Treat young stock and adult animals with the same treatment protocols
- C. Treat only when there is a demonstrated need
- D. Monitor parasite and performance indicators to guide treatments

2 WHICH OF THE FOLLOWING ARE UNLIKELY TO CONTRIBUTE TO RESISTANCE DEVELOPMENT:

- A. Frequent dosing
- B. Overestimating animal weights
- C. Dosing when the pasture burden is extremely low
- D. Underestimating animal weights

3 WHICH ANTHELMINTIC CLASS IS CURRENTLY ADVISED FOR OSTERTAGIA TYPE II DISEASE?

- A. Benzimidazoles and levamisoles
- B. Levamisoles and macrocyclic lactones
- C. Benzimidazoles and macrocyclic lactones
- D. Macrocyclic lactones

4 WHICH OF THE FOLLOWING CAN INFLUENCE THE FAECAL EGG COUNT?

- A. Storage of the sample
- B. The species composition of the internal parasites
- C. The volume of faeces produced
- D. All of the above

ANSWERS: 1B; 2B; 3C; 4D.