Practical guidance in providing advice on farm-specific parasite control

Rebecca Carroll, programme manager, Beef HealthCheck Programme, Animal Health Ireland (AHI), discusses a new leaflet developed by the AHI's Parasite Control Technical Working Group, which provides a framework for veterinary practitioners drawing up a parasite-control plan

The purpose of the AHI leaflet, 'Practical guidance in providing advice on Farm-specific Parasite Control', is to provide a framework and aide-memoire for veterinary practitioners drawing up a parasite-control plan. The advice focuses on the common helminth and arthropod infections of cattle in Ireland.

Parasites are one of the most important constraints on livestock production, yet receive little attention from clinicians unless things go badly wrong. This may be because parasites do not always have an immediate and dramatic impact, or because parasite control is often farmer-led and driven by the relatively easy access to anti-parasite treatments. However, this picture is changing as veterinary practitioners become more involved with parasite control on livestock farms for reasons such as herd health plans, unsatisfactory control, emerging parasitic infections or disease patterns and anthelmintic resistance.

Before conducting an on-farm assessment consider the following three points.

1. WHAT THE VET SHOULD KNOW

The effects of parasites at farm level can range from suboptimal performance – lowered growth rates in young stock and reduced milk yield in dairy cows – to serious clinical disease. While the necessity to treat clinical cases and prevent their recurrence is self-evident, it is more difficult to assess the magnitude of sub-clinical production losses. Therefore, familiarity with the results of controlled studies, carried out to investigate the impact of subclinical infections, is useful. For example, even in the absence of clinical signs, parasitic gastroenteritis (PGE) in weaned, first-grazing season calves can result in average reductions in daily live weight gain of 20% or more over the grazing season.[1] Similarly, in dairy cows, subclinical ostertagiosis can account for a reduction in daily milk yield of an average of ~1kg/day over the lactation.[2] The magnitude of these losses can vary in line with parasite challenge and farm-level factors.

Knowing and understanding the science behind the

Parasite biology	Helminths	Values	Relevence
Pre-patent periods (period between with a parasite and the recovery of an egg, ocyst or larva from the faeces)	GI nematodes* Lungworm Liver fluke Rumen fluke**	~3 weeks ~3-4 weeks ~3 months ~3 months	Population dynamics Strategic use of anthelmintics
Minimum time from egg/larva in dung to intefctive stage on pasture, includes time in snail for liver fluke	GI nematodes Lungworm Liver fluke Rumen fluke**	<1 week in summer ~2-4 weeks spring and autumn <1 week in summer ~2-4 weeks spring and autumn ~2 months in summer >3 months spring and autumn ~3 months	Seasonality of exposure Risk assessment Rotational grazing Rate of build of infection pressure on pasture
Survival of infective stages on pasture	GI nematodes Lungworm Liver fluke Rumen fluke**	Susceptible to desiccation and ultra-violet light, but even so, typically survive for 12 months or more	Risk assessment of pastures Quarantine Rerugia Carry over of infection from year to year

Table 1: Helmeth biology *GI nematodes = stomach and gut worms ** Information on the biology of *Calicophoron daubneyi* in Ireland is currently sparse, so these values are extrapolated from the scientific literature for other species of rumen fluke in other countries.

biology and impact of parasites and their control underpins evidence-based advice; Table 1 shows some examples of useful facts.

Another important aspect of parasite biology is host specificity as this will determine to what extent mixed or sequential grazing (commonly with sheep) can be used in parasite control. *Ostertagia ostertagi*, *Cooperia oncophora*, *Dictyocaulus viviparous*, lice and mange mites are host-specific. This is in contrast to *Trichostrongylus axei*, *Fasciola hepatica*, *Calicophoron daubneyi* and *Ixodes ricinus*, which are less fastidious and may infect and complete their lifecycle in species outside cattle.

In some cases, it may be possible to diagnose parasitic disease by clinical signs alone. However, given the subclinical nature of many parasitic infections, other diagnostic approaches are often necessary. Common methods to diagnose and/or monitor parasitism in cattle are given in the Table 2.

For some parasites, such as lungworm, confirmation of presence or absence provides sufficient information to advise on treatment and control. For other parasites, such as those involved in PGE, some degree of quantification is required to determine the magnitude of the risk and/or impact.

Measures of pathophysiology or measurements of performance are likely to be more informative than measures of the parasites alone, such as faecal egg counts (FEC).

On many farms, the control of endemic parasites rests on the responsible use of parasiticides to limit selection for resistance, allied to grassland management, where appropriate and feasible. The control of lice and mange currently rests solely on the use of insecticides and acaricides, so the emphasis here is on accurate identification of the parasites, selection of an appropriate product, accurate dosing (weight of stock, calibrated equipment) and prevention of cross- or re-infection.

For helminth infections acquired while grazing, it may be possible to mitigate, limit or avoid the risk of infection by appropriate pasture and stock management; this approach is particularly important on organic farms.

When giving advice on treatment, vets should consider the properties and profiles of parasiticides that are used in cattle including their spectrum and persistence activity (if any), formulations available, withdrawal periods and resistance status.

2. WHAT YOU CAN OBSERVE ON FARM

Ostertagia ostertagi and *Cooperia oncophora*, the most common nematodes in PGE, are present on all grassland farms, but grassland management, field layout and forage conservation may provide some strategies to reduce exposure.

The management of different age-groups/classes of stock should also be considered as this can determine priorities for grazing (eg. after-grass) and flexibility in the use of paddocks. In addition, the presence of sheep or other stock should be determined to see if mixed grazing is an option for helping to control PGE.

There are no specific farm-level indicators for lungworm, but for liver and rumen fluke, the presence of suitable habitats for the mud snail, *Galba truncatula*, would indicate a risk. Mud snails breed on mud in shallow, still or slow moving water.

Parasite	Parasite markers	Immune response	Pathophysiology	Pathology	Effect on performance
O ostertagi	Faecal eggs	Antibodies in serum or milk	Plasma pepsinogen	Abomassal lesions	Growth retardation Milk yield depression
D viviparus	Faecal larvae	Antibodies in serum or milk	Eosinophilia	Lung pathology	Milk yield depression Growth retardation
F hepatica	Faecal eggs, coproantigen	Antibodies in serum or milk	Liver enzymes: GLDH, GGT	Liver pathology	Growth retardation Milk yield depression Immuno-suppresion
C daubneyi (Rumen fluke)	Faecal eggs		Serum protein	Duodenum (juveniles)	Ill-thrift
Mange	Scrapings			Dermatitis	Growth retardation Milk yield depression
Lice	Visual ID		Anaemia *(L vituli)*	Dermatitis	Growth retardation Inferior hide quality

Table 2: Parasite diagnostics.

Similarly, the rough grazing that is associated with tick habitats and the risk of redwater can usually be readily identified.

Handling systems and presence of weigh scales will determine the ease with which animals can be handled for sampling or weighing, and the level of precision in treatment that is achievable. A farm visit should also include an inspection of anthelmintics on the farm, the storage facilities and administration equipment.

3. WHAT CAN YOU LEARN FROM THE FARMER?

As a first step, gather information from the farmer on the parasites known to be present and current control practices, along with any details of seasonality, age of stock affected and overall impact. Ask for the results of any diagnostic procedures that have been conducted, such as abattoir feedback for liver fluke*, the results of any post-mortems and laboratory tests.

All parasites, particularly helminths, can interfere with production targets and close inspection of available production records may help determine if, when and where parasites are causing problems.

It is important to determine if high-risk practices for parasitism or anthelmintic resistance, are being followed. These could include: using the same paddocks each year for young stock rearing; releasing calves in batches of different ages through the grazing season on to the same pasture; contract rearing of replacements on other farms and a history of recent outbreaks of clinical disease, such as hoose.

Finally, information on some of the more subjective aspects of the farmer's behaviour needs to be gathered, such as; attitudes towards the use anthelmintics; preferences for drenches, injections, pour-ons or long-lasting formulations; knowledge and application of grazing management; willingness to invest in diagnostics or handling/weighing equipment; and response to advice.

It is important to understand farmers' knowledge, objectives, attitudes and aspirations around parasite control, in order to tailor advice appropriately, that is likely to be accepted and acted on.

A farm visit that is focussed on parasite control can provide a solid base for advice on disease control and optimisation of production tailored to the specific characteristics of the land, the stock and the farmer.

See www.animalhealthireland.ie to view the new leaflet, 'Practical guidance in providing advice on Farm-specific Parasite Control'. The AHI Beef HealthCheck programme provides farmers with paper reports on liver and lung lesions from cattle slaughtered in the majority of Irish meat factories. The information is also available online on the ICBF website. See www.beefhealthcheck.ie for more information.

REFERENCES

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