

A Guide to Parasite Control at Turn-out

Parasite Control Leaflet Series, Vol.2, Ver. 2., December 2014



PARASITE CONTROL PROGRAMME



Parasite Control
Animal Health Ireland.ie

Animal Health Ireland, 4-5 The Archways, Carrick-on-Shannon, Co. Leitrim, N41 WN27

AHI gratefully acknowledges the financial and other contributions of our stakeholders.



PARASITE CONTROL PROGRAMME



Animal Health Ireland, 4-5 The Archways, Carrick-on-Shannon, Co. Leitrim, N41 WN27

Please refer to the disclaimer on the last page regarding information in this leaflet.

THIS GUIDE IS THE SECOND IN A SERIES OF THREE,
MATCHED TO KEY PERIODS OF FARM MANAGEMENT

1. Parasite Control at Housing
2. Parasite Control at Turn-out
3. Parasite Control at Grazing

INTRODUCTION

Calves are born free of parasites. They pick up infection while grazing pastures harbouring the infective stages of these parasites i.e. the larvae and metacercariae (encysted stage of fluke that causes infections). Thus, turnout marks the start of exposure to parasites on pasture, such as:

- 1 Stomach and intestinal worms; collectively called gut worms*
- 2 Lungworms*
- 3 Liver fluke and rumen fluke*

When cattle are turned out, a combination of shorter summer coats, higher temperatures, less humidity and exposure to ultra-violet light leads to a marked decline in lice and mite populations - thus the control of these skin parasites is generally not considered an issue during the grazing season.

* There are individual leaflets on each of these parasites available on the AHI website www.animalhealthireland.ie.

1 Gut Worms

Gut worms cause parasitic gastroenteritis (PGE)- clinical signs of which are diarrhoea and weight loss. *Ostertagia* and *Cooperia* are the two worms that cause most problems for Irish cattle. The control of gut worms depends on:

1. Grazing management
2. Good nutrition
3. Appropriate use of anthelmintics

1. Grazing Management

The objective is to reduce the concentration of infective larvae on pasture and so reduce the parasite challenge to grazing cattle.

- New or reseeded pastures should have very low numbers of infective larvae initially.
- Pastures that have not been grazed by cattle from the previous housing to mid-season (June/July) may carry lower numbers of infective larvae.
- Pastures that have been grazed by sheep alone for 1-2 months should carry lower numbers of bovine infective larvae.
- Pastures that have been co-grazed with sheep and cattle should carry lower numbers of bovine infective larvae.
- Pastures subject to rotational grazing generally have lower numbers of infective larvae than those under continuous grazing.
- Pastures that contain forbs, e.g. clover and chicory may carry lower concentrations of infective larvae than pure ryegrass swards.



Ostertagia Type II.

Image courtesy of Donal Toolan, RVL Kilkenny, DAFF.

2. Good Nutrition

Appropriate supplementation of cattle diets at pasture can offset some of the negative effects of poor quality herbage and parasites.

3. Appropriate Use of Anthelmintics

Anthelmintic resistance is a key consideration in sustainable control of parasites. Therefore, these drugs must be used carefully in order to benefit both animals and farmers. Because of differences in susceptibility resulting from acquired immunity to worms, it is easiest to consider cattle in three different age categories: adults, second grazing season (SGS) and first grazing season (FGS).

1. Adult cattle

It is rare for adult cattle to show any clinical signs of gut worm infestation, yet many studies, particularly in dairy cows, have shown evidence of subclinical infections with production losses. Reported benefits from treatment generally relate to milk yield; however, in a few studies, beneficial effects on body condition and fertility have also been observed.

2. Second season grazers

These animals are not fully immune to gut worms and can experience production losses and occasionally disease. Lack of exposure to infection during the FGS, as seen in late-born calves, beef suckler calves or under intensive anthelmintic treatment regimes may result in lower levels of immunity at the start of the SGS.

3. First season grazers

These calves initially have no immunity to parasites and are at risk of clinical, as well as subclinical gut worm infestations. Suckler calves and dairy calves must be considered separately in terms of risk factors.

Beef Suckler Calves

Initially Beef Suckler calves are at a low risk as they are grazing with their mothers and have low herbage intake. There is also an apparent effect of milk on parasitic roundworms such that the adverse effects of these worms are reduced. Their greatest risk periods are after weaning in late summer and autumn.

Growth rates should be monitored and faecal samples from 10 - 15 calves (which can be pooled) can be checked to determine how many worm eggs are present. If nutrition appears adequate, significant numbers of worm eggs are present and growth rates are below target, then the use of anthelmintics is justified.

Results of recent research indicate that satisfactory group performance can be maintained by treating only those animals with growth rates that fall below target.



Dairy Calves

Dairy calves are exposed to infection as soon as they are turned out. Clinically significant infections can be evident within a couple of months of turn-out, but calves can suffer subclinical losses even earlier.



The use of anthelmintics in dairy calves can be considered under three categories

1. Strategic Management

The aim is to limit egg contamination of pastures. Initially calves should be grazed on the cleanest possible pasture. Treat within the first 3 weeks of grazing and repeat throughout the grazing season at appropriate intervals depending on the residual activity of the drug used (see Table 3 as a guide) until mid-July. Treated calves should be kept on the low risk pasture throughout the treatment period and ideally for the rest of the grazing season. If calves are subsequently moved to different paddocks, it may be necessary to continue treating throughout the grazing season with an anthelmintic.

2. Tactical Management

Monitor and only treat when appropriate. Grazing aftergrass will reduce the need for repeated treatment.

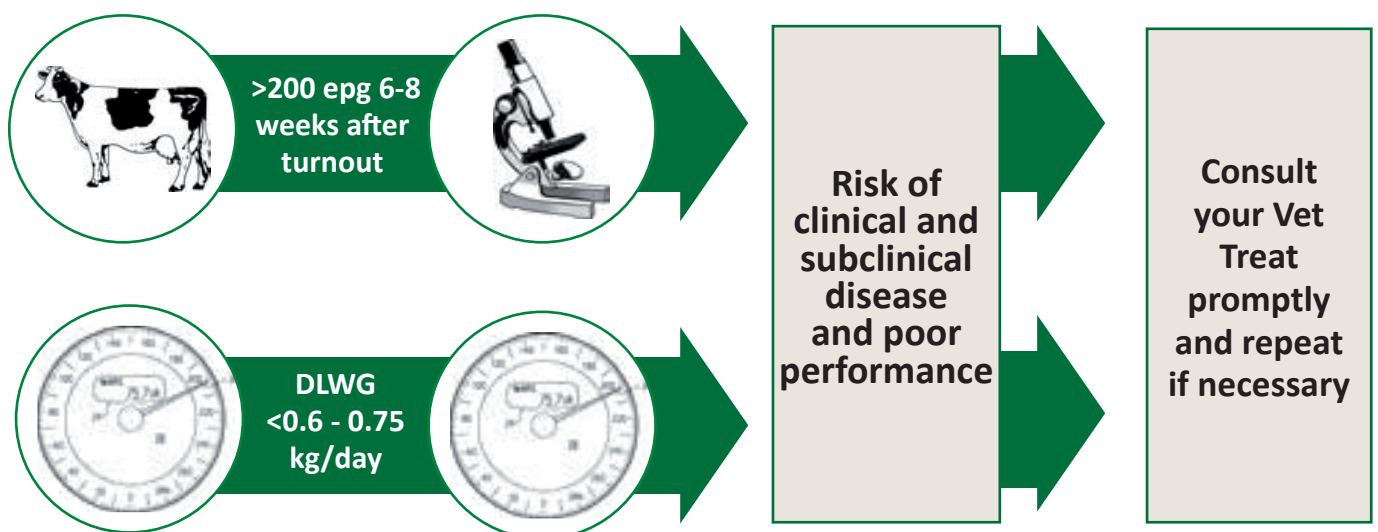


Figure 1: Monitoring calves for live weight gain and faecal egg counts from 2 months after turnout can provide a guide to control options

3. Therapeutic Management

Animals are monitored until they show signs of clinical disease, such as weight loss and diarrhoea, and are then treated.

This may be the only option in systems such as organic farms. There is a high risk of poor animal performance through subclinical PGE and of clinical problems if animals are not treated early enough to prevent severe diarrhoea,



Monitoring animal performance is key throughout grazing for parasite control

2 Lungworms

Clinical signs of lungworm infection ('hoose', *Dictyocaulus viviparus*) include coughing and difficulty in breathing. Affected cattle have an increased susceptibility to viral and bacterial pneumonia. Immunity to lungworm develops quickly but is relatively short-lasting (approx. 6 months) in the absence of further infection.

At the start of each grazing season, following housing, cattle may have very little or no immunity to lungworm and thus are susceptible to new infections again. The highest challenge risk periods for animals are late summer and autumn.



Hoos worms in airways of a 3-yr-old cow.

Image courtesy of Donal Toolan, RVL Kilkenny, DAFF.

Lungworm Control and Treatment

An assessment of the pastures on a farm can be carried out to estimate the level of lungworm contamination and potential for future disease outbreaks. However, the unpredictable nature of the disease, the rapid development of larvae in faeces and the efficient dispersal to the sward make lungworm control through various grassland management practices challenging. Even with the adoption of grazing practices as outlined below, farmers need to remain vigilant for any clinical signs.

Recommended turn out and grazing strategies include:

1. The ideal option is to turn first grazing season calves out onto pasture on which there were no cattle the previous year.
2. If the previous option is not available, then calves can be turned out onto pasture grazed by adult cattle the previous year.
3. Calves should be kept housed until they can be turned out onto pasture as one group.
4. If calf turnout is staggered, then the later calves should be turned out as one group onto another low risk pasture.

A live lungworm vaccine is now available in Ireland and can provide good protection against hoose. It is recommended that the vaccination schedule is completed prior to turnout; this should be straightforward in autumn-born calves, but is problematic in conventionally managed spring-born calves. Booster vaccinations can be given to older cattle before turnout each year. Farmers are advised to discuss lungworm vaccination with their veterinary surgeon to see if it can be incorporated on their farms.

Regardless of which control options are followed, it is essential that all ages of cattle are closely monitored over the grazing season and in the early housing period. Treatment of the whole group should be undertaken as soon as possible if clinical signs appear, in order to limit the impact of the infection and contamination of pastures.

Hoose in adult cattle

Hoose can occur in adult cattle in two distinct ways resulting in animals with broadly similar clinical signs.

If animals have no immunity, the disease is similar to that of calves i.e. patent infection where the ingested larvae develop into adult worms. This lack of protection can result from insufficient exposure, for example through the use of very low risk pastures or intensive anthelmintic treatment. These animals can develop severe pneumonia and die.

If cows that are partly resistant to lungworm are exposed to heavy larval challenge from pasture they may develop severe coughing (Reinfection Syndrome) or milk drop as their immune system kills the migrating larvae. The majority of these animals will not have hoose larvae detectable in faeces. Diagnosis may be supported by clinical signs, grazing history and by a blood test to measure circulating eosinophils in blood.

3 Liver fluke and rumen fluke

Liver fluke (*Fasciola hepatica*) is a common infection in cattle and sheep. Disease is seen in animals of all ages. Typical symptoms are condition loss, lower productivity and increased susceptibility to other diseases.

It takes approximately 10 -12 weeks before fluke eggs appear in the faeces following infection, so the cycle of infection is much longer than in gutworm or lungworm infestations.

1. First season grazers (FSG Calves)

It may be unnecessary to treat with flukicides until the autumn and/or at housing as spring-born calves will initially carry no liver fluke. However, if they graze heavily infested pastures they can be exposed to fluke from early on in the season. Advice may vary depending on weather, fluke forecast and farm history so farmers should discuss control with their vet.



Liver Fluke (*Fasciola hepatica*).

Image courtesy of Dr Orcun Hacariz and Pablo D. Rojas, School of Agriculture Food and Veterinary Medicine, UCD.

Beef suckler calves born in spring will be at a lower risk than dairy calves as their herbage intake is relatively low for the first few months of life while they are suckling their dams, thus their risk is highest later in the grazing season.

2. Second Season Grazers (SGS Calves) and Adult Cattle

Older cattle are commonly treated at housing (see AHI *A Guide to Parasite Control at Housing*). When the cattle are turned out the following spring, they should not be infected and will therefore not contaminate the pastures with fluke eggs. There should be a delay before snails can acquire new infections and continue the life cycle; however, over-wintering infection in snails is a possibility. If cattle have not been treated at housing, then treatment with a flukicide effective against adult liver fluke before turn-out will ensure that contamination of the pasture with fluke eggs is kept to a minimum.

Between turn-out and housing, the need for treatment depends on the severity of the risk of liver fluke on the farm: if severe, then additional treatments 2 - 3 months after turn-out and again in the early autumn may be indicated in order to limit the overall level of challenge on the farm.

3. Sheep

If sheep are present on farm, they must be included in a liver fluke control programme - the fluke is exactly the same as that seen in cattle.

Sheep are highly susceptible to liver fluke disease, and infected sheep generate high levels of pasture contamination with fluke eggs, so they must also be treated if the disease is to be kept under control.

Dosing failure, possibly due to resistance to triclabendazole appears to be quite widespread in sheep in Ireland, therefore, it may be worthwhile checking faecal samples for liver fluke eggs two weeks after treatment to evaluate if the treatment has been effective.

What is the risk of parasitic infection?

Signs of parasitism include reduced growth rates, reduced fertility, decreased milk yields, and animals that are coughing or scouring. Affected animals can be treated, however, prevention is a better strategy on farm. Parasite control should be based on consideration of numerous risk factors and observations.

Table 2 provides a guide to assessing the risk of parasites on your farm. The changeable Irish weather also has a large impact - warm, wet weather is conducive to parasite development on pastures, so higher challenges can be expected under these conditions. Furthermore, if dry weather predominates for a few weeks, followed by a period of heavy rain, the parasite challenge from pasture can increase significantly.

Table 2: Risk assessment matrix for disease and production losses from parasites in cattle

RISK FACTOR	RISK		
	High	Medium	Low
PGE			
Age (grazing seasons, GS)	<1 year (First GS)*	1-2 years (Second GS)	>2 years (adult)**
Weight gain (<2 years old) 2 months after turn-out	<0.7 kg/day	0.7-0.8 kg/day	>0.8 kg/day
Faecal worm egg count (FGS)*** 2 months after turn-out (epg)	>200	50 - 200	<50
Herbage mass kg DM/ha	<1000	1000 - 2000	>2000
Sward height	<4 cm	4 - 8 cm	>8 cm
Field type	Permanent pasture	Silage/hay after grass	Newly sown, ungrazed leys
Grazing history within the last year	Grazed by cattle <1 year old	Grazed by cattle 1-2 years old	Grazed by Adult cows, sheep**** or other species
Condition score (adults)	<2.0	2.0 - 3.0	>3.0
Bulk milk tank <i>O. ostertagi</i> antibodies (ODR) (dairy herd)	>0.8	0.5 - 0.8	<0.5
LIVER FLUKE			
Snail habitats	Widespread	Patchy	Fenced off /none
Faecal fluke egg count (epg)	>20	1 - 20	0
Fasciolosis diagnosed	Previous year	>5 years previously	Never
LUNGWORM			
Lungworm diagnosed	Previous year	>5 years previously	Never

* beef suckler calves are at low risk of PGE before weaning, ** Adult cattle rarely suffer from clinical PGE, but are susceptible to lungworm (if immunity is low) and to liver fluke. ***weaned dairy calves. **** If sheep are infected with liver fluke, they can increase the risk of liver fluke in cattle.

Table 3: A guide to anthelmintic and flukicide treatments available in Ireland, their efficacy against important

	Anthelmintic			Flukicide			
	Benzimidazoles	Levamisole	Macrocytic lactone	Closantel	Nitroxynil	Triclabendazole	Rat
Formulations	o	o/inj/po	inj/po ¹	o/inj	inj	o	
ROUND WORM (<i>Ost</i>							
Adults	✓	✓	✓				
Larvae	✓		✓				
Inhibited larvae	✓		✓				
Persistency			✓ 3-6 weeks ³				
Cooperia							
Adults	✓	✓	✓				
Larvae	✓	✓	✓				
Persistency			✓ ² 2-4 weeks ³				
LUNGWORM (<i>Dictyo</i>							
Adults	✓	✓	✓				
Larvae	✓	✓	✓				
Persistency			✓ 4-6 weeks ³				
LIVER FLUKE (<i>Fasciola</i>							
Adults	✓ (Albendazole only)			✓	✓	✓	
Immature - Early						✓ ³	
Immature - Late				✓ ³	✓ ³	✓ ³	

¹eprinomectin only as pour-on

²except moxidectin

³see data sheets for more details

stages of parasites and their persistency of action

		Combination Treatments				
Rafoxanide	Oxyclozanide	Ivermectin + clorsulon	Ivermectin - closantel	Levamisole + oxyclozanide	Levamisole + triclabendazole	Rafoxanide + Fenbendazole
o	o	inj	inj/po	o	o	o
T. evansi)						
		✓	✓	✓	✓	✓
		✓	✓			✓
		✓	✓			✓
		✓ ³	✓ ³			
T. vivax)						
		✓	✓	✓	✓	✓
		✓	✓	✓	✓	✓
	✓ ³	✓ ³				
T. brucei)						
		✓	✓	✓	✓	✓
		✓	✓	✓	✓	✓
		✓ ³	✓ ³			
T. theileri)						
✓	✓	✓	✓	✓	✓	✓
					✓ ³	
✓ ³	✓		✓ ³		✓ ³	✓ ³

Monitoring of parasite infections on dairy farms

The use of bulk milk samples as a monitoring tool for parasites is currently being examined in Ireland. Milk samples can be analysed to see if they contain antibodies to *O. ostertagi* (Roundworms), *D. viviparus* (hoose) and *F. hepatica* (liver fluke) and, if so, what the levels and trends are. While *O. ostertagi* is present on all farms, the impact of the parasite on production (and thus the value of treatment) can be estimated from the concentration of antibodies found. The other two tests are in earlier stages of development, but they may indicate whether or not the parasite is present on your farm.

Interpretation of results from these tests needs to be done in the context of the overall herd health and milk production pattern. At the present stage of testing development, it is important to note that using the results from these tests alone will not be enough to design a comprehensive parasite control plan. Ideally, this should be done in consultation with the farm vet who understands the herd health and production history.

TECHNICAL WORKING GROUP

Andrew Forbes (Chairperson) - School of Veterinary Medicine, Glasgow University; **Mícheál Casey** - Central Veterinary Research Laboratory Backweston, DAFM; **Charles Chavasse** - Zoetis; **Bosco Cowley** - MSD Animal Health; **Martin Danaher** - Teagasc Food Research Centre Ashtown, Teagasc; **Michael Doherty** - UCD School of Veterinary Medicine; **John Gilmore** - Veterinary Practitioner, Roscommon; **Barbara Good** - Teagasc, Athenry; **Fintan Graham** - Veterinary Practitioner, Laois; **Ian Hogan** - Regional Veterinary

Laboratory Limerick, DAFM; **Maura Langan** - Norbrook Laboratories; **Grace Mulcahy** - UCD School of Veterinary Medicine; **Tom Murphy** - Parasitology Specialist **Maresa Sheehan** - Regional Veterinary Laboratory, Kilkenny, **Donal Toolan** - retired from Regional Veterinary Laboratory Kilkenny, DAFM; **Theo de Waal** - UCD School of Veterinary Medicine.

TECHNICAL WORKING GROUP RAPPORTEUR

Rebecca Carroll, Animal Health Ireland.

INTELLECTUAL PROPERTY

All images contained in this leaflet are the property of AHI, or have been included with the permission of the owner. Please seek permission from AHI if you wish to use these images and provide the correct attribution of ownership when reproducing them. If reusing any other material in this leaflet, please attribute AHI as the source. Image of *Ostertagia* Type II (Page 2) and Hoose worms (Page 5) are courtesy of Donal Toolan, Kilkenny RVL. The liverfluke image has been provided courtesy of Dr Orcun Hacariz and Pablo D. Rojas, School of Agriculture Food and Veterinary Medicine, UCD.

IMPORTANT NOTICE - DISCLAIMER

This leaflet is issued and shall be read only on the basis that it will not be relied upon by any person as a basis for any act or omission or otherwise without obtaining professional veterinary and health and safety verification and advice and that no liability or responsibility to any person is accepted or shall be incurred, and no recourse or claim by any person will be made, by or against AHI, any stakeholder, collaborator, officer, agent, subcontractor or employee of AHI, any member of the Technical Working Group, any contributor to, author, publisher, distributor, reviewer, compiler or promoter of or any other person

in respect of or in connection with the leaflet or the contents thereof or any matter omitted therefrom.

No representation or guarantee is given, whether by AHI or any other such person, that the contents of this information leaflet are comprehensive, up to date, or free from error or omissions, nor that the advice provided is appropriate in every particular circumstance.

The contents of this information leaflet are not intended to be a substitute for appropriate direct advice from your veterinary practitioner. Appropriate veterinary and health and safety advice should be taken before taking or refraining from taking action in relation to the animal disease dealt with in this information leaflet.

The contents of this leaflet may be updated, corrected, varied or superseded from time to time by later publications or material on the AHI website and reference should be made to that website accordingly.

Any references in this booklet or links in the AHI website to external websites or other resources are provided for convenience only and the content thereof are not to be considered as endorsed thereby.



Animal Health Ireland, Main Street, Carrick-on-Shannon, Co. Leitrim

Phone 071 9671928

Email admin@animalhealthireland.ie

Web www.animalhealthireland.ie

