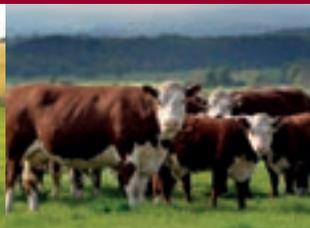
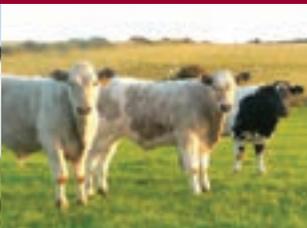




**Better Returns
Programme**

BEEF BRP MANUAL 9

Controlling worms and liver fluke in cattle for Better Returns



Information in this booklet has been drawn from the COWS - Control Of Worms Sustainably technical manual.



www.cattleparasites.org.uk

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For more information contact:

**Better Returns Programme
AHDB Beef & Lamb
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL**

**Tel: 024 7647 8834
Email: brp@ahdb.org.uk
beefandlamb.ahdb.org.uk**

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Any enquiries related to this publication should be sent to us at AHDB Beef & Lamb, Stoneleigh Park, Kenilworth, Warwickshire CV8 2TL.



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Internal parasites (worms and fluke) pose a significant threat to animal health and performance. Sheep farmers in particular rely heavily on chemical treatments for control. Unfortunately this has led to resistance developing in worm populations and some products becoming ineffective.

So far, resistance in cattle worms is relatively uncommon, although there are signs that it could become a problem. Producers should not be lulled into thinking it will not happen, as it probably will.

The sheep industry came together in 2003 to develop the Sustainable Control of Parasites in Sheep (SCOPS) guidelines. These allow farmers to maintain good worm control, while preserving the activity of wormers for future use.

Control of Worms Sustainably (COWS) is a similar initiative for the cattle industry. Following these guidelines will help beef farmers achieve long-term control of parasites without undue selection for anthelmintic resistance, thus optimising performance in their cattle.



Dr Mary Vickers
Livestock Scientist
AHDB Beef & Lamb

The threats

Endoparasites – organisms that attack an animal’s internal organs, as opposed to ectoparasites that affect the outer skin, cause the English cattle industry £millions in lost production and treatment costs.

Fortunately through better grazing management and/or the use of effective chemical treatments, the impact of parasites can be limited.

Cattle generally acquire immunity to gut worms and lungworms through exposure to infection as young animals. However immunity is incomplete and older cattle can suffer from disease too, though generally less severely. Consequently young cattle in their first and second grazing season are normally the focus for worm control. However, there is no immunity to liver fluke and cattle of all ages are at risk.

Wormer resistance

Resistance to the three older groups of wormers has been widely reported in the UK sheep industry, which limits the treatment options for sheep farmers. However, there are now two new wormer groups that can be used to control resistant worms.

So far, resistance in cattle worms is relatively uncommon in this country. However, there have

been reports that some roundworm species are resistant to products in wormer Group 3 (page 8).

Understanding the basic life cycles of the most important parasites and following the COWS (Control of Worms Sustainably) guidelines for responsible anthelmintic use, will help ensure treatments remain effective now and in the future.

Worm terms

Worms are also referred to as:

Endoparasites, helminths

Nematodes – roundworms, eg gut worms, lungworms

Trematodes – flat worms, eg liver fluke, rumen fluke

Veterinary treatments can be called:

Anthelmintics

Wormers

Parasiticides

Cattle can be affected by many different endoparasites. However, there are four species of worm and fluke of particular importance. It should also be remembered that cattle are often infected with more than one type of parasite at the same time.



Ostertagia ostertagi
(Stomach worm)



Cooperia oncophora
(Intestinal worm)



Dictyocaulus viviparus
(Lungworm)



Fasciola hepatica
(Liver fluke)

The presence of worms causes a reduction in appetite and feed intake and also stops animals utilising the nutrients in their food properly. This can lead to poor growth rates and performance. For example, replacement heifers may not reach target weights for mating and finishing cattle may take longer than expected to be reach the required specifications for marketing.

Left untreated, infection with these parasites can cause disease and death, though the most common manifestation is chronic ill-thrift.

Parasite	<i>Ostertagia ostertagi</i> (Stomach worm)	<i>Cooperia oncophora</i> (Intestinal worm)	<i>Dictyocaulus viviparus</i> (Lungworm)	<i>Fasciola hepatica</i> (Liver fluke)
Disease	Parasitic gastroenteritis		Bronchitis and pneumonia. Also known as husk/hoose	Fasciolosis: Damage to liver and bile ducts seen at slaughter
Signs in affected animals	Loss of appetite, watery green scour, rapid weight loss and poor growth rates		Persistent coughing. Laboured breathing	Poor weight gain. Loss of body condition Reduced fertility



Watery green scour



Laboured breathing



Animal with poor growth rates



Liver infected with liver fluke

Parasite life cycles

Parasitic worms undergo a life cycle that typically includes a reproductive, egg-producing adult stage and a series of developmental larval stages, some of which take place in the environment or an intermediate host.

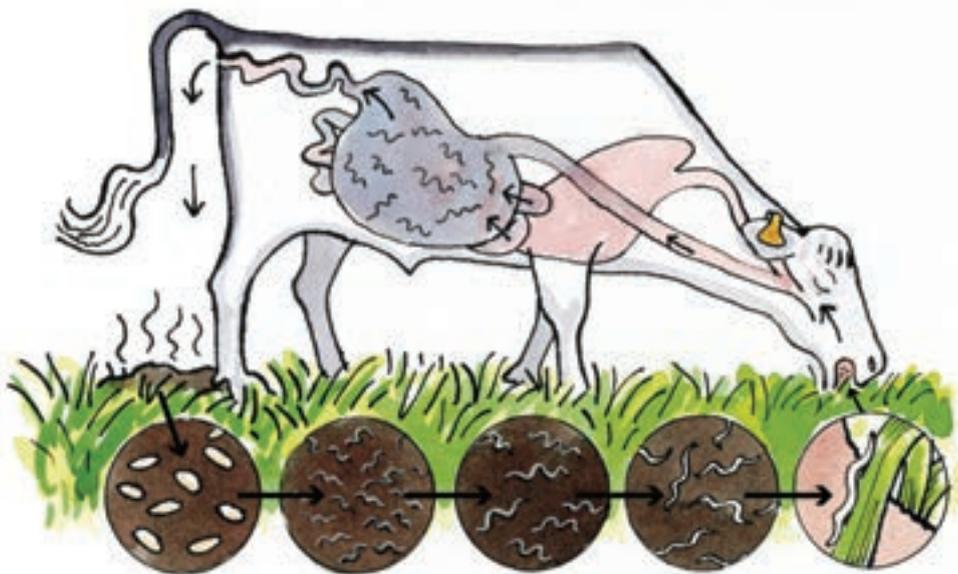
Life cycle of gut worms

Adult worms in the gut lay eggs that are passed out in the dung, where they develop within the dung pat to become infective larvae. Under warm and moist conditions, development can be completed within one or two weeks. Once the larvae are on pasture, they pose a threat to cattle as they graze.

After larvae are eaten along with grass, they reach the stomach or intestine, where they establish and grow into adult worms over a period of about three weeks. Adult female worms then start laying eggs and the cycle is complete.

The complete life cycle of gut worms takes a minimum of about four weeks – one week on pasture, three weeks in the animal.

There is a common variant to the normal life cycle, which is particularly important in stomach worms and occurs in the late summer and autumn. As the temperature drops and the days become shorter, the larvae instead of developing into adult worms inside the animal, over the following three weeks they become inhibited (arrested) and further development ceases. They effectively hibernate for several months until the late winter when they resume development and become adult worms. This phenomenon can occur in cattle of any age, but is a particular risk to young cattle if they have acquired high populations of inhibited *O.ostertagi* larvae in the autumn. Simultaneous emergence of large numbers of adult worms in late winter causes acute disease, which can be fatal in some cattle. The scientific name for this condition is Type II ostertagiasis.

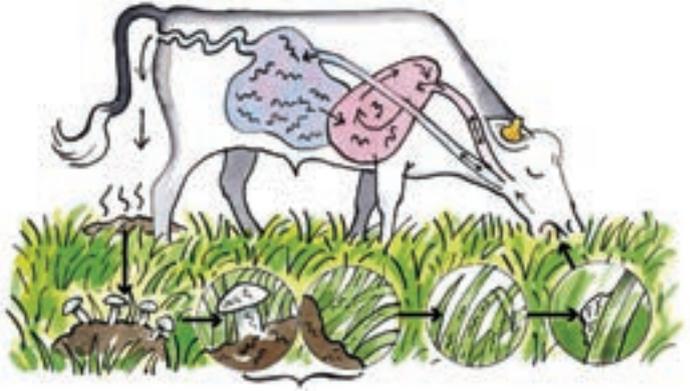


Life cycle of lungworms

Adult female worms produce eggs in the lungs which hatch almost immediately. The young larvae travel up the wind pipe, are swallowed and eventually pass out in the dung. The larvae develop further in the pat and after a week or less, move onto the grass, either through their own activity, helped by rainfall, or by attaching to the spores of fungi, which also grow on dung pats.

After they have been eaten, the larvae penetrate the animal's gut and travel to the lungs, where they mature into adults over a period of about three weeks. Adult female worms then start laying eggs and the cycle is complete.

The complete life cycle of lungworms takes a minimum of about four weeks – one week on pasture, three weeks in the animal.

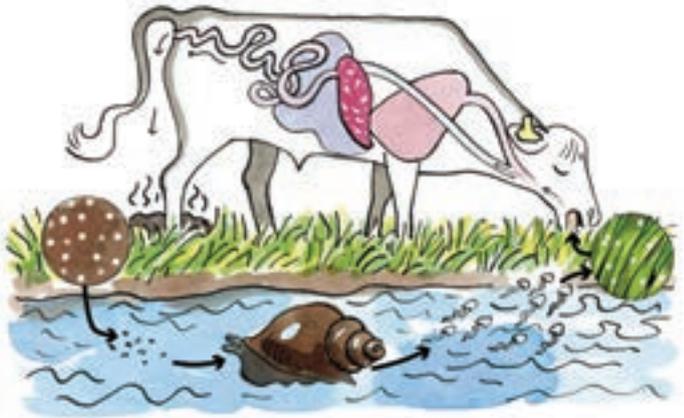


Life cycle of liver flukes

Adult fluke eggs pass out onto pasture in the dung where the next stage develops within a minimum of about two weeks into what looks like a microscopic tadpole. This hatches and swims off to find a mud snail. Within the snail young fluke develop and multiply into the next developmental stage over a period of six weeks or more, after which they emerge from the snail and attach to the surrounding vegetation. After being eaten by grazing cattle, the juvenile flukes migrate to the liver, through which they tunnel over a

period of around eight weeks, causing considerable tissue damage. They then emerge into the bile ducts where they spend their adult lives. The adult fluke start producing eggs around 12 weeks after being ingested, so completing the cycle. Liver fluke are long-lived and unless the cattle are treated with an effective flukicide, can live for one to two years.

The whole cycle takes a minimum of 20 weeks, comprising 12 weeks inside the animal and eight weeks on the pasture and in the snail. Depending on weather conditions, there may be only one complete cycle per year.

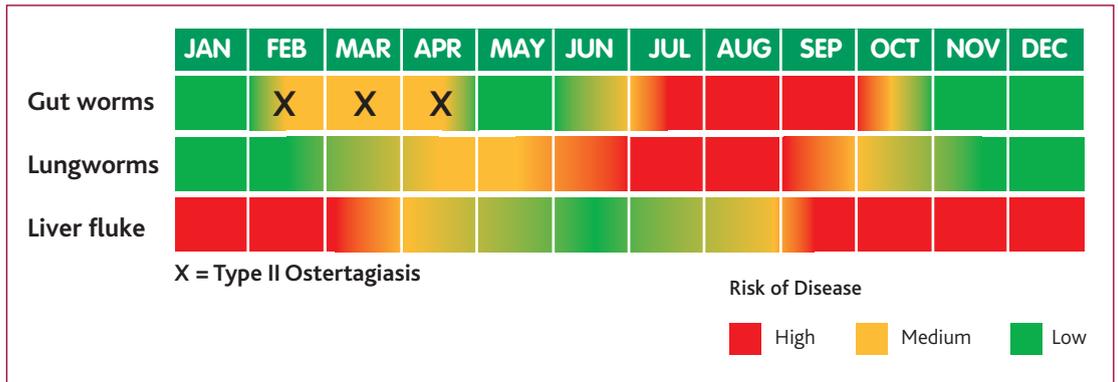


High risk periods

The risk of infection and disease varies according to the type of parasite. Generally there is a seasonal pattern, as the free-living stages and the snail intermediate hosts (for liver fluke) are weather dependent.

Typically, disease caused by stomach and lungworms is seen in the summer and autumn, while liver fluke damage occurs mainly in autumn/winter.

Risk of disease throughout the year



Natural immunity

Cattle naturally acquire immunity to gut and lungworms while grazing and this is maintained by continual exposure while at pasture. Although the use of anthelmintics can reduce the concentration of infective larvae on pasture, generally there is still sufficient exposure to infection for immunity to develop.

Required duration of exposure to the parasite to gain immunity

Parasite	Exposure
Ostertagia	Two grazing seasons
Cooperia	One grazing season (three to six months)
Lungworm	One to two months, but repeat exposure is needed to maintain immunity
Liver fluke	Neither young nor adult cattle develop immunity to liver fluke

Spring-born, suckled calves grazing with their mothers do not usually suffer from stomach worms. This is because main food source is their mothers' milk, so consequently they eat less grass and therefore less worm larvae. However, once weaned in the autumn, they can suffer from high worm burdens, as their diet is solely grass and they have not been exposed to sufficient worms to develop immunity.

Infection of pasture with gut worms

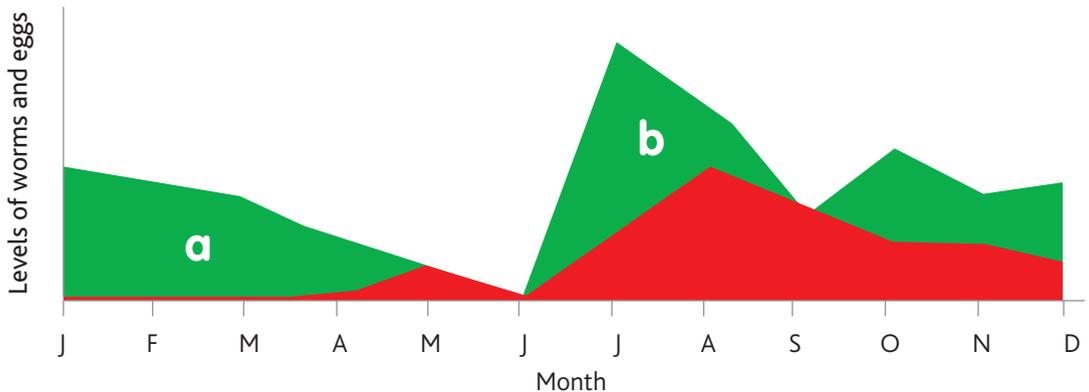
When cattle are turned out in the spring, they encounter infection that is derived from larvae that have survived on the pasture over the winter. The survival of larvae depends largely on temperature. These larvae do not feed and can only live for as long as their energy stores are sufficient. Larval survival over winter can be higher in cold conditions, particularly under snow, because their metabolism slows right down and their energy supplies deplete slowly. Conversely, over a mild winter, the metabolism is faster and the energy stores disappear quickly.

After three weeks, these newly acquired infections will result in an adult population of worms that

start to lay eggs. These eggs deposited on pasture in spring, develop slowly to the third larval stage, but as temperatures increase from April to June, the time taken for development shortens. The net result is that by mid-July there is an abundance of larvae on the pasture (graph 1). So, while some ill-thrift can occur in the first two to three months after turnout, the risk of significant loss of weight and scouring is greatly increased from July onwards.

The general pattern of events for lungworm is similar to stomach worms, although lungworm tends to be less predictable.

Graph 1: Infection of pasture with gut worms



a – over-wintered larvae; b – new season larvae

 **eggs**  **larvae**

Infection of pasture with liver fluke

Liver fluke eggs hatch in warm, moist conditions. In wet springs and summers, snail populations multiply rapidly and can become infected with fluke parasites.

If wet weather continues, the snails shed massive numbers of infected stages onto the pasture which, if eaten by cattle, lead to liver fluke disease.

Dry or cold weather in early summer reduces the number of snails and parasite transmission, so fewer fluke eggs hatch and contamination in autumn is much lower.

Snails infected in late summer can overwinter in large numbers in mild winters, leading to contaminated grazing the following spring. This can cause significant early season infection.

Wormers

A range of cattle wormer products is available in the UK for the control of gut worms, lungworm and liver fluke. These fall into three main categories:

1. Broad-spectrum anthelmintics that kill gut worms and lungworms
2. Narrow-spectrum flukicides (wormers that kill liver fluke)
3. Combination wormers that kill gut worms, lungworms and liver fluke

Broad-spectrum

The broad-spectrum products fall into three groups based on their chemical structure and mode of action. They all control *Ostertagia*, *Cooperia* and lungworms, as well as other gut roundworms.

<p>Group 1  Benzimidazoles (BZ) White drenches Resistance status: • Cases on most UK sheep farms • No resistance reported on UK beef farms</p>	<p>Group 2  Levamisoles (LV) Yellow drenches Resistance status: • Cases increasing on UK sheep farms • No resistance reported on UK beef farms</p>	<p>Group 3  Macrocyclic lactones (ML) Clear drenches Resistance status: • Cases increasing on UK sheep farms • A few cases reported on UK beef farms</p>
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Persistency

Wormers can be given to cattle via several different delivery methods, including drenches, injections, pour-ons and boluses (see pages 12 and 13). One of the key attributes of wormers, which has a direct impact on how they should be used, is their persistent activity. Anthelmintics can be described as:

- Short-acting: duration of activity one day only
 - Any of the products containing a BZ or LV other than boluses
 - All the flukicides singly or in combination products
- Long-acting: duration of activity typically around four weeks, depending on worm species
 - ML injections and pour-ons
 - Combination products containing MLs
- Ultra-long-acting: duration of activity four to five months
 - BZ boluses
 - ML (moxidectin) long-acting injection

The advantage of long-acting products is that they require less frequent administration and therefore less animal handling. The ultra-long-acting products effectively provide cover for a complete grazing season. A potential disadvantage of persistent activity is that it may accelerate selection for anthelmintic resistance compared with short-acting products. However, there is currently no scientific evidence that this occurs in cattle.

Withdrawal periods

All anthelmintics have strict withdrawal periods before which cattle must not be slaughtered/enter the human food chain. These vary from as little of five days up to eight months. Follow the manufacturer's recommendations at all times on withdrawal periods.

Treatment strategies

The worm challenge on every farm is different and changes every year. Treatment plans should take into account unique factors such as farm location, disease history, current season/weather and the type and age of stock.

In general for:

Gut worms

Target treatments at youngstock in their first and second grazing seasons. Use in conjunction with grazing management that minimises the risk of infection (see page 17).

Calves can be dosed at the onset of disease, or wormed preventatively early in the season to limit pasture contamination. This will reduce the animals' exposure to infective larvae later in the year.

Lungworm

Lungworm is controlled by most wormers active against gut worms. In high risk situations, vaccination of calves offers the most reliable protection.

Liver fluke

In liver fluke areas, yearling and adult cattle should be treated after housing. Products vary in their ability to kill juvenile fluke and the timing of administration may need to be adjusted accordingly. Animals kept outdoors may require additional treatments, depending on the liver fluke risk. Given the resistance issues emerging with the flukicide triclabendazole, it is important to limit use of this product. An alternative product can be used for treating adult liver fluke in cattle.

NB: Keeping stock off wet areas which could harbour the mud snail intermediate host will help reduce incidence of disease.

Delaying resistance

Resistance is the inherited ability of a parasite to tolerate a normally effective dose of a wormer. Resistance builds up over successive parasite generations on a farm.

Confirmed cases of wormer resistance in cattle gut worms are still relatively rare in Europe and confined to the intestinal worms *Cooperia* and typically relate to the ML wormers. Any under-dosing with MLs will allow some *Cooperia* to survive and treatment failure may be due to inaccurate administration rather than resistance.

Most experts agree that resistance is inevitable, but can be delayed by responsible wormer use.

Factors that may increase the speed of selection for anthelmintic resistance in cattle include:

- High frequency treatments over a period of six months or more
- Under-dosing
- Continual use of wormers, including flukicides, from the same action family

Always consult the data sheet, read the product label and follow the manufacturer's recommendations before using any wormer.

Persistency of a product is not the same as its withdrawal period – please check the product information.

COWS – Control Of Worms Sustainably

COWS is an industry-led initiative aiming to promote more effective and responsible use of wormers.

Each wormer treatment should be justified for its known benefit to the cattle being treated in the short or long term.



Guideline 1

Work out a worm control strategy with the vet or an advisor

Developing a cost-effective, reliable and sustainable worm control programme is not straightforward, as so many factors come into play and the situation can change during the year and between years.

Consultations between farmers, their vets and advisors, need to be on-going. An agreed worming strategy should form an integral part of the herd health plan.

Vigilance for any clinical signs of parasitic worms – for example, scour, regular coughing and ill-thrift and performance monitoring, form the backbone of parasite control. Specific dung and blood tests can also be used to help with diagnosis and the choice of optimal control in terms of both management and anthelmintics.



Guideline 2

Quarantine imported animals to avoid introducing unwanted parasites, including anthelmintic-resistant worms

Three steps for successful quarantine (gut and lungworms)

1. Determine which parasites are already on the farm and which ones need to be kept out. If possible, speak to the vendor to see what parasites may be present and what treatments have been given before sale.
2. If practical, yard or house all purchased cattle and administer appropriate anthelmintics for the target parasites. This may include a combination of different anthelmintics, administered sequentially, targeting different worms including ML-resistant *Cooperia*. The choice of appropriate products requires specialist knowledge, so seek advice from the vet or Suitably Qualified Person (SQP) at the retailers.
3. Dung samples can be taken two to three weeks after treatment to establish if the treatments have been successful in removing all the parasites. If worm counts are negative, then cattle can be turned out if desired.

Quarantine procedures for liver fluke

Liver fluke resistance to triclabendazole has been reported in sheep and more rarely in cattle. Quarantine strategies should take a 'risk-based' approach and a treatment with one of the other fluke products may be appropriate. If in doubt consult the vet or an advisor.

As infected animals can pass eggs for up to three weeks after the adult fluke have died, treated cattle should be kept off pastures for at least four weeks after treatment.

Any sheep brought onto the farm should also be treated according to SCOPS guidelines, as they could be an important source of resistant liver fluke to all grazing stock.



Guideline 3

Test how well a wormer works on the farm

Testing how well a product is working helps identify whether resistance to certain wormers is developing, or whether poor results are down to poor technique, such as under-dosing.

The presence of wormer resistance can be investigated by:

Post-dosing faecal egg counts (wormer tests)

Faecal samples are taken from a group of ten animals that have been grazing together, one to two weeks post-treatment, depending on the product used.

This provides an estimate of the effectiveness of the wormer. Failure to reduce the egg count requires investigation.

Faecal egg count reduction tests (FECRT)

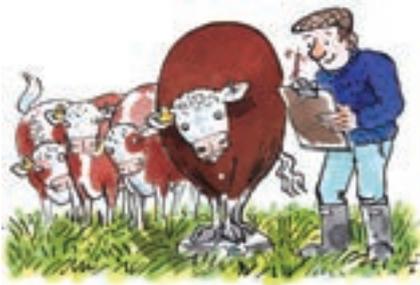
This is a more complicated test, undertaken on different groups of animals. Egg counts are performed on samples taken before and after treatment.

Wormer resistance is suspected if the reduction in faecal egg counts of the test group compared with a control group that was not treated, is less than 95%.

Ask the vet for more details.

Guideline 4

Use wormers correctly



There are two key points to accurate dosing, which apart from boluses, is based on administering a specific volume of wormer to a particular liveweight of animal.

- Weigh all cattle individually
- Calibrate dosing equipment to ensure it is delivering the correct volume of liquid

The only way to accurately measure liveweight is to use a weigh scale or weigh band. Visual estimates are notoriously inaccurate.

Both under- and over-dosing can have untoward consequences and farmers should make every effort to ensure accurate dosing.

Always use the full dose rate, even where two products are being administered at the same time, eg for a quarantine treatment.

Delivery methods

Pour-ons

Apply along the length of the flattest part of the back, from the withers to the tail head.

In general do not treat when the hair is wet, or rain is anticipated within two hours of treatment. NB some products are waterproof and can be used on wet animals.

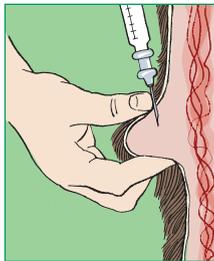
Avoid damaged skin and areas covered with mud or manure.



Injectables

Injections should be given subcutaneously at the site recommended by the manufacturer.

- Always use a clean, sterile syringe and needle. If using a multiple injection gun, disinfect needle between injections
- If the injection site is dirty, clean the skin and swab with an alcohol impregnated wipe or cotton wool
- Before injecting, read the label. Some products need to be shaken before use
- Use the correct sized needle for the size of animal and injection site
- Restrain the animal adequately
- Raise a fold of skin and inject carefully into the space created
- If a large dose is to be delivered, split between two injection sites. Briefly massage the site afterwards
- Dispose of needle and syringe in appropriate clinical waste and sharps containers.



Oral drenches



Oral drenching guns are designed to deliver over the back of the tongue so that the entire dose is swallowed into the rumen.

Bad dosing technique may allow the product to bypass the rumen which will reduce its potency.

Drenching equipment must be correctly calibrated and in good working order. Test it with product just before treatment starts by delivering two or more doses into a measuring cylinder. Do not use water as this will give a false result.

Faulty equipment, or attempting to dose too quickly, may mean the barrel of the gun does not fill properly, or that the liquid is full of bubbles.

Risking resistance

Under-dosing, using faulty dosing equipment, or treating in inappropriate conditions, can encourage wormer resistance to develop.

This is because worms with some resistance to the product can survive a lower dose treatment, where a full dose would have killed them.

Storage

Wormers should be stored securely, away from direct sunlight at 4-25°C. Check the 'use by' date and once open use within the period shown on the packaging.

Boluses

Boluses should be administered with the correct applicator. The animal must be restrained and great care taken not to damage the throat or cause choking.



Insert the applicator from the front of the mouth over the back of the tongue, with no more than gentle

firm pressure. As the animal begins to swallow, passage into the throat becomes easier. Once in the throat the plunger should be pressed to release the bolus. The applicator is then gently removed while checking that the bolus has been swallowed.

Guideline 5

Use wormers only when necessary

The control of worms enables cattle to perform well and meet production targets, as well as being free of clinical disease. However, cattle are able to tolerate small burdens of parasites. Wormers can be a valuable tool to optimise cattle performance and it makes sense to use them sensibly to control costs and avoid any unwanted side-effects, including anthelmintic resistance.



Youngstock first grazing season

The risk posed by worms to youngstock depends on when they were born and whether they are grazing with their mothers or have been weaned. The most susceptible are weaned calves grazing for the first time on pastures that have carried cattle any time in the preceding 12 months, as they have no immunity and rely solely on grass for food. Autumn-born suckler calves can be quite susceptible, but benefit from their mothers' milk, which reduces reliance on pasture alone and provides some protection from the effects of worms too. Spring-born calves are the least at risk, as grass and therefore worm larvae, comprise a relatively small proportion of their intake until they are weaned in autumn.



Youngstock second grazing season

Several important production targets can occur during the second grazing season, eg mating of replacement heifers and finishing of non-breeding stock. The most important potential impact of parasites in these animals is on their growth rates, as any reductions in liveweight gain will delay service or marketing. Consequently, the best indicator for parasite control/treatment is liveweight gain, which is a good indicator of parasite burden, providing the feed is adequate and that there are no other obvious causes of poor growth. On farms which are high risk for fluke, this parasite also needs to be controlled in yearlings.



Adult cattle

Adult cows are generally immune to gut worms and lungworms if they have had adequate exposure. However, under some circumstances, ill-thrift and even clinical disease can occur. Nevertheless, beef cows do not normally need to be treated routinely, though worming at housing can be a useful, low-risk option to keep gut and lungworm populations down. There is no immunity to liver fluke, so if cows graze fluky pastures, they may need treating at least once a year, typically at housing and possibly once again during the grazing season. Do not forget breeding bulls. They are more susceptible to worms than cows, so may benefit from worming, particularly leading up to the breeding season.

Monitoring

On-going monitoring of youngstock for the following points is important for controlling parasite:

- Daily vigilance for any clinical signs of worms such as coughing, scouring, anaemia or weight loss
- Monitoring growth rates, particularly in weaned calves

Faecal sampling and worm egg counting can provide an idea of how heavily pastures are being contaminated. However, they are poor indicators of the impact of gut worms on health and performance and should not be used alone as triggers for anthelmintic treatment. If fluke eggs or lungworm larvae are found in dung samples, this would be a strong indicator for treatment.

Regional weather forecasts and parasite risk assessments such as the service run by the National Animal Disease Information Service (NADIS), can also be consulted before deciding if and when to treat.

How to take a good dung sample

- Collect fresh dung (less than one hour old)
- Put in airtight container or plastic bag
- Keep cool but not frozen
- Deliver to lab within 48 hours
- If the sample is for lungworm, deliver to the lab as quickly as possible



Guideline 6

Use the right wormer in the right way

Treatments should be targeted according to the parasites and their life cycle stages present, the time of year and previous treatment history.

Anthelmintics from the three main groups differ in their activity, formulations available, duration of activity and withdrawal periods. Obtain advice on the most appropriate product to use.

Avoid inadvertent use

Take care when using combination products such as a flukicide plus a broad-spectrum wormer and do not use when only liver fluke is the target for control. Use a specific flukicide instead.

Guideline 7

Preserve susceptible worms on the farm

Practising a strategy of 'dose all' and then moving cattle to pastures with low contamination levels, is now considered highly selective for wormer resistance. To take advantage of low risk fields, eg silage aftermaths, take steps to mitigate the risk of resistance, such as leaving a few fit animals untreated or not grazing the paddock with young cattle subsequently.

Strategies to reduce resistance developing:

- Leave a few youngstock in good body condition untreated
- Delay moving after dosing

This allows treated calves to become lightly re-infected with susceptible worms which will dilute the numbers of surviving resistant worms.



Guideline 8

Reduce dependence on chemical treatments

Good grazing management can provide high-quality nutrition for cattle, which can help them withstand the effects of parasites and can also reduce the risk of acquiring worm infections when at pasture.

The risk of gut worms can be reduced by utilising low risk pastures and avoiding highly infective grazing. This may also help reduce the risk of lungworm. For liver fluke, the only option, if practical, is to avoid grazing damp areas that harbour mud snails, particularly in the late summer and autumn.

With the exception of liver fluke, most of the gut worms and lungworm are exclusive to cattle. So if other livestock, eg sheep are available, they can be used in mixed or sequential grazing systems to reduce the number of cattle worm larvae on pasture.

Older stock that is partially immune to worms, generally pass dung containing fewer worm eggs and so do not contaminate the pastures to the same extent. It must be remembered however, that larger animals produce more dung, so they cannot be ignored as sources of contamination.

Risk assessment for pastures for PGE

	High Risk	Medium Risk	Low Risk
Spring	Grazed by first year youngstock in the previous year.	Grazed only by adult or yearling cattle the previous year (including cows with calves at foot).	New leys/seeds or forage crops. Sheep or conservation only the previous year.
From mid-July	Grazed by untreated, first year, weaned calves.	Grazed by adult cattle.	Ungrazed silage or hay fields or grazed by sheep; newly-sown forage crops or arable by-products.



Risk and control summary

System	Features	Implications for control
Spring-calving suckler herds	Before weaning, calves are at low risk of worm infections	Watch out for lungworm, otherwise no treatments usually required
	Wean calves onto low risk pastures or at housing if possible	Watch out for lungworm. Treat with an ML at housing. If grazing for more than two months prior to housing, treat with an ML after weaning
	Treat for liver fluke during housing if risk identified	
	Second grazing season stock should be partially immune	Watch out for lungworm and liver fluke. Monitor growth rates and treat as required
	Cows in good condition and on adequate nutrition should remain largely unaffected by gut worms, but are susceptible to liver fluke	Monitor condition scores and clinical signs. Focus any treatments on housing. May need treatment for liver fluke during grazing season
	In general, bulls are more susceptible to parasites than cows	Treat before and after mating season
Autumn-calving suckler herds	Autumn-born calves are at higher risk than spring-born calves because they ingest less milk, graze more and are weaned earlier in the grazing season	Vaccinate against lungworm on high risk farms. Be vigilant for clinical disease before weaning; treat with wormer at weaning and thereafter monitor growth rates and treat accordingly. Treat with an ML at housing
	Second season calves, cows and bulls – as for spring-calving herds	As for spring-calving herds
Bought-in stores and finishing cattle	On arrival, follow quarantine protocol	Treat according to parasites present on farm and to avoid introduction of unwanted parasites. Consider lungworm vaccination if high risk on farm
	Following quarantine, depending on age and history, follow guidance for second grazing season stock	Watch out for lungworm and liver fluke. Monitor growth rates and treat as required

Other useful information sources

The **BRP Beef and Sheep Parasite Control Product Guide**: email brp@ahdb.org.uk or call **024 7647 8834** for a free copy.

Also available on the AHDB Beef & Lamb website: beefandlamb.ahdb.org.uk

National Office of Animal Health – www.noahcompendium.co.uk

National Animal Disease Information Service – www.nadis.org.uk

COWS – www.cattleparasites.org.uk



Better Returns Programme

Wormer purchase checklist

Is treatment needed?

All farms have gut worms, but does the farm also have liver fluke or lungworm?

Have animals been grazing high-risk pastures?

Has wet weather/grazing conditions increased the likelihood of liver fluke infection?

Have Faecal Egg Counts (FECs) and/or blood tests been taken and what are the results?

What are the target parasites?

Treatments should be chosen according to the specific parasites and their life cycle stages present, time of year and whether a curative or preventative treatment is required.

In general problems usually occur for:

- Gut worms during grazing season
- Lungworms from June onwards
- Liver fluke from autumn onwards

What is the preferred application method?

- Pour-on
- Bolus
- Injection
- Oral drench

Manufacturers' recommendations should always be followed and the full rate applied. Dosing equipment should be calibrated with a sample of the product, not water.

Withdrawal periods

Consider withdrawal periods carefully when choosing a product.

What products have been used recently?

In cattle, some resistance has been reported to macrocyclic lactones and triclabendazole. Avoid sustained use of products from one group to reduce the risk.

Lungworm can also be treated by vaccination which may require an annual booster.

What pack-size is required?

Cattle should ideally be individually weighed so they receive the recommended dose.

When purchasing, if a pack size is going to be slightly less than required, it is better to leave one or two fit animals not dosed than under-dose the whole group.

For more information contact:

Better Returns Programme

AHDB Beef & Lamb
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel: 024 7647 8834

Email: brp@ahdb.org.uk

beefandlamb.ahdb.org.uk

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