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COWS

Control Of Worms Sustainably
Strategies for cattle

DairyCo

Control Of Worms Sustainably - COWS

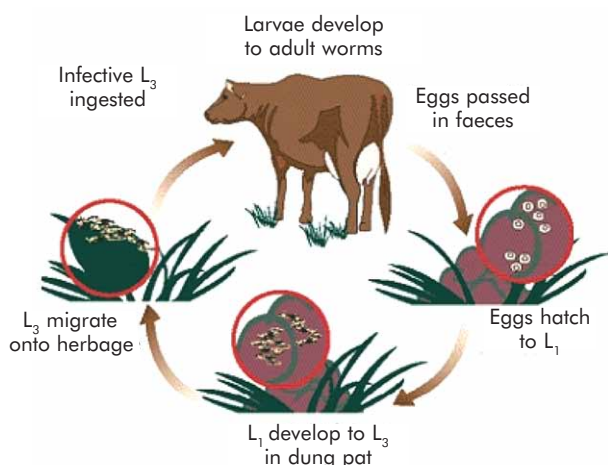
Controlling Anthelmintic Resistance (AR) in Cattle

Worms (Endoparasites) can cause a wide variety of clinical signs depending on the species involved but all cause general loss in production, decrease in fertility and poor growth rates.

In comparison to the sheep industry, there have been few reported episodes in the published literature on wormer (anthelmintic) resistance in the bovine. Surveillance data from various sources indicates that *Ostertagia ostertagi* (brown stomach worm) is the main parasite associated with parasitic gastro enteritis whilst *Cooperia* spp. (Cooper's worm) are very common in young cattle in their first grazing season and the main contributor to worm egg counts, particularly where treatment failures are suspected. *Dictyocaulus viviparus* (lungworm) has been increasingly reported in first year grazing calves. Infections due to *Fasciola hepatica* (liver fluke) may cause a loss in production in milking cows during the winter and can be clinically difficult to detect. The areas where fluke have been diagnosed are increasing in the UK and this may be a common problem in other countries, where grazing is practiced.

Anthelmintic resistance is one of the reasons for apparent inefficiency but other reasons include;	
Dosing Technique • dosing with insufficient anthelmintic • underestimation of the animal's weight • poorly maintained dosing equipment.	Or Rapid re-infection of animals after treatment from highly infective pastures.
Or Failure to follow the manufacturer's instructions: • not storing the products correctly • using products beyond their use-by date • applying products incorrectly, or under adverse weather conditions (pour-ons) • mixing anthelmintics with other products.	Or Use of the incorrect drug for the target worms.

Figure 1. The basic life cycle of the nematode parasites of cattle



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The following guidelines are recommended and these are based on the successful Sustainable Control of Parasites in Sheep that is used as the industry standard in the UK.

Guideline	Comment
Work out a control strategy with your veterinarian or advisor.	Health planning using specialist knowledge and ongoing consultation.
Use effective quarantine strategies to prevent the importation of resistant worms in newly purchased cattle.	Cattle bought into the herd can be a potential source of introducing resistant alleles into a herd.
Test for anthelmintic efficacy on your farm.	While resistance is still rare in cattle nematodes, treatment failures do occur. It is important to monitor efficacy as underdosing can select for anthelmintic resistance.
Administer anthelmintics effectively.	Administer the right doses in the correct way following manufacturers' instructions.
Use anthelmintics only when necessary.	There will be a 'trade off' between tolerating a certain level of parasitism and minimising selection for anthelmintic resistance. Faecal egg count monitoring has an important role.
Select the appropriate anthelmintic for the task.	Consider narrow spectrum treatments whenever possible, use rotation of wormer families in appropriate ways.
Adopt strategies to preserve susceptible worms on the farm.	Aim to reduce heavy selection for anthelmintic resistance when treating adult cattle, immune older animals or when dosing on low contamination pastures.
Reduce dependence on anthelmintics.	Alternative control measures include grazing management using sheep or older immune animals.

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Quarantine treatments

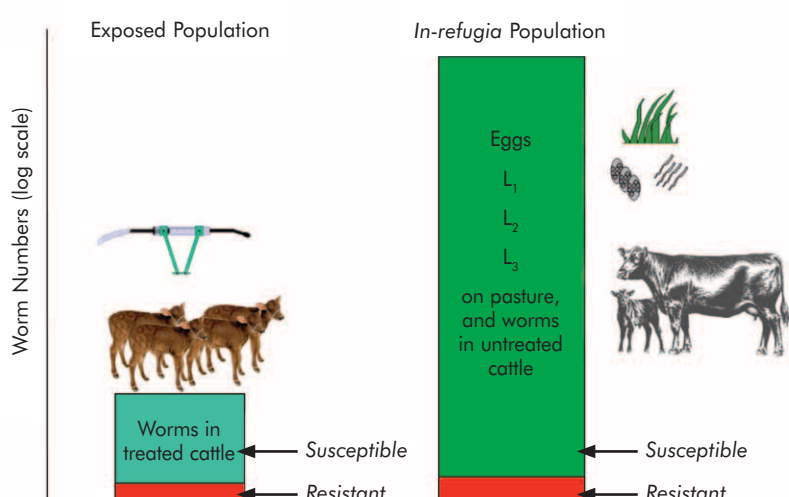
These should be on a risk based approach taking into account where the new animals have come from, in respect of fluke areas and previous treatments.

Pasture risk

Pasture can be split into high, medium or low risk according to previous grazing management.

Time of year	High risk for worm infestation	Medium risk for worm infestation	Low risk for worm infestation
Spring	Grazed in the previous year by first year calves.	Grazed in the previous year by adult or second year cattle.	Newly reseeded as either grass or forage crops. Previously grazed by sheep or been in conservation management.
Mid July onwards	Previously grazed in the spring by first year calves.	Previously grazed in spring by cattle. 'Clean' pasture grazed by parasite free calves.	Previously grazed by sheep in the spring. Previously been in conservation management or forage crops of arable by-products.

Figure 2. The exposed and in-refugia worm population



The worms inside the dosed cattle are exposed to the anthelmintic. Worms that are free-living on pasture, or exist as adults or larvae in untreated animals, are in-refugia. The in-refugia population is typically much larger than the exposed population and the relative sizes of these two populations influence how rapidly AR develops. There are resistant and susceptible worms in both populations but only the susceptible worms in the exposed population (in blue) are removed by treatment.

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For those systems that use grazing as part of their management they can generally be split into three types:- those where cows predominantly calve in the spring or the autumn and those where calving occurs all year round. Generally in all systems, calves are removed from their dams either at birth or soon after birth.

System	Features/risks	Implications for control
Spring calving herds	Adult cattle usually immune but maybe sub-clinical production effects on high producing animals. Calves turned out in spring may experience infections from overwintering of worms and larvae on pasture and show clinical signs of infection. Calves grazing the same pasture as older calves and cows become exposed to high worm burdens from mid July onwards. Housed calves may acquire significant infection early in the next spring.	Monitor and treat if appropriate or considered necessary. Turnout calves on to low risk pastures and minimise pasture contamination using timed treatments with appropriate wormers. Use lungworm vaccination in high risk areas. Monitor using faecal egg counts and treat where necessary or move on to low risk pasture from mid July onwards. Turnout calves onto low risk pasture. Treat in early part of grazing season to minimise pasture contamination. Lungworm vaccination in high risk areas.
All year round calving herds	Calves born in the spring may be put on pasture at two to three months of age or as a year old the following spring. Calves born in late summer or autumn may not graze until the following spring.	Monitor using faecal egg counts and preventative control measures where necessary. Alternatively move to low or moderate risk pasture in the spring.
Autumn calving herds	Calves grazing the same pastures as older calves become exposed to higher worm burdens from mid July onwards.	Monitor using faecal egg counts and treat where necessary or move on to low risk pasture from mid July onwards. Treat for possible arrested worm development on housing in the autumn.

Control Of Worms Sustainably - GLOSSARY

Acquired immunity

Immunity acquired following exposure to parasite antigens as opposed to innate immunity which is natural resistance to an organism.

Carrier animals

Animals infected but showing no clinical signs.

Direct life cycle

There is no intermediate host in the life cycle.

Ectoparasites

Parasites that live on the surface of the host or embed themselves into the skin.

Endoparasites

Parasites that live within the body of the host.

Epidemiology (epizootiology)

Factors governing the spread of infection and disease through host populations.

Generation time

Time taken for one generation to complete its life cycle. This can be from a few days (e.g. coccidia) to several years (e.g. the sheep tick) and may be dependent on climate.

Helminth

A parasitic worm including the class types nematode (roundworm), cestode (tapeworm) or trematode (fluke).

Indirect life cycle

An intermediate host is involved in the life cycle.

Intermediate host

A host (other than the final host) in which development (sometimes including asexual reproduction) of the parasite takes place - usually an essential part of the life cycle.

Control Of Worms Sustainably - GLOSSARY

Nematode

A worm in the Class Nematoda, these are round worms.

Parasitic Zoonosis

Parasitic infection transmitted from vertebrate hosts to man.

Prevalence and incidence

The prevalence of infection is the proportion of an animal population harbouring the parasite; the incidence of the associated disease is the number of new cases per unit time. Thus the prevalence of liver fluke in a herd of cattle in an endemic area is likely to be 100% but the incidence of fasciolosis in that herd will probably be much lower.

In-refugia

Term used to describe the free-living stages of parasitic worms present on pasture either as eggs or larvae.

Reservoir host

An infected definitive host, which can act as a source of infection for other animals.

Transport host

A loose association in which the parasite "hitches a lift", i.e. is merely carried. This may be a means of geographical dispersal or of enhancing opportunity for infecting a host.

This initiative for the cattle sector has been done in conjunction with EBLEX.



Supporting Organisations



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