

Internal parasites (worms)

Internal parasites need to be properly managed to prevent debilitating effects on animal performance, mortalities and lost productivity. Best practice aims at achieving this through nutrition and correct management with minimal drug and pesticide usage to avoid residues in milk or meat and risk of development of drug resistance in parasites or disease-causing bacteria.

Round worms (nematodes) and flat worms (platyhelminthes) i.e. fluke and tapeworm can seriously impair growth of young animals (weaning to about eight months) causing loss of condition, scours, anaemia and death in severe infestation. The major action of nematodes is in the stomach or small intestine where they attack the gut wall, consuming blood, causing anaemia and reducing the nutrient absorptive capacity of the tissues resulting in further debilitation through nutrient deprivation.



Calf debilitated by internal parasites displaying loss of condition, green scour and oedema ('bottle jaw').

Where they occur

Moisture is essential for worm survival and moist pastures are the ideal environment for worms to survive, multiply and infest animals. Internal parasites are a greater problem in higher rainfall environments, following wet weather and where pastures are intensively stocked. Young cattle are most susceptible to the effects of worms, their immunity develops with age and exposure to the parasites and is maximal by one to two years of age. Immunity is reduced where nutrition is poor or environmental conditions adverse. Heavily stocked, permanently grazed calf and heifer paddocks are ideal for growing worms, but less than perfect for heifer rearing.

Nematodes

Common nematodes (round worms) in the subtropics and tropics are the warm season types.

Species	Common name
Haemonchus placei	Barber's pole or stomach worm
Cooperia oncophora	Small intestinal worm
Oesophagostomum radiatum	Nodule worm
Bunostomum phlebotomum	Hookworm

Dictyocaulus viviparus (lungworm) can occasionally reach significant levels usually in conjunction with a heavy burden of other worms. It is more common in high rainfall upland areas. Lungworms migrate through the body and reproduce in the lungs causing pneumonia, coughing and death. The heavy cough is often noticeable after exercise.

Cool climate worms which may be found in southern Queensland:

- Trichostrongylus axei (hair worm) is less common. It is found in cooler winter rainfall regions and is a problem parasite of southern Australia.
- Ostertagia ostertagi may occur in cooler subtropical areas with winter rain but is less common in summer rainfall regions. This parasite can cause severe effects in areas where it occurs. It differs from other round worms in that larvae may enter a dormant or 'inhibited' phase rather than develop to maturity. This inhibited stage is more resistant to commonly used anthelmintics, and as a consequence worm populations can explode unexpectedly at times of stress. This parasite can also cause production losses in adult animals, especially if they are already under production, nutritional, health or other stress.

Symptoms

The most common symptom of roundworm infestation often is least recognised - reduced productivity - lower growth rates and milk production. More obvious symptoms of heavy worm infestation in young cattle include diarrhoea (green scour), anaemia, 'bottle jaw' (oedema), dehydration, loss of body condition, rough coat, ill-thrift and death.

Platyhelminths

Tapeworms

Tapeworms (Cestoda) are gut parasites, but generally are considered a lesser problem than nematodes as their major action is as a competitor for the host animal's food. As a secondary parasite they will compound the debilitating effects of a primary nematode problem. Heavy infestation could reduce feed intake or flow of digesta by blocking the digestive tract.

Fluke

Stomach fluke (Paramphistomes, Amphistomes) and liver fluke (*Fasciola hepatica*) occur in high rainfall and swampy areas and effect both young and adult cattle. Their secondary host is a snail specific to each parasite (*Helicorbis*, *Lymnaea*), which lives in moist environments and is required for completion of the parasites' life-cycle. Host snails may also be present in water troughs in risk areas. Fluke infestation is common in drought when cattle graze areas that normally would be inundated. Distribution of liver fluke is limited but their effects can be severe, causing anaemia poor growth, oedema, weight loss and death. Liver damage by migrating flukes may trigger the fatal Black Disease (*Clostridium novyi*), more common in southern Australia. Stomach fluke are widespread in coastal Queensland. Adult fluke live in the reticulo-rumen but do not cause serious problems to the animal. Blood-sucking immature fluke migrate in the intestines and large numbers can cause anaemia, severe diarrhoea and dehydration.

Diagnosis and control

Diagnosis

Calves carrying heavy worm burdens often have signs of ill thrift, loss of condition, oedema (bottle jaw), rough coat and a green scour. Faecal examination of calves and heifers for worm eggs, before they show these signs will identify if and when drenching is necessary to prevent economic loss. Faecal egg counts can be undertaken by most veterinary laboratories and private veterinarians.

Control

Impact of internal parasites is less when animals are well fed. Good rearing and management practices will reduce the need for anthelmintic treatment. Control involves management of pasture and stock to minimise pasture infestation. Lower stocking density, fertiliser use on heifer paddocks, longer pasture rotation and treatment of calves prior to entry to a fresh paddock all help to reduce worm populations on pasture. Uncontrolled, worm populations increase after the onset of the wet season and can build to very high populations over three or four breeding cycles (parasite lifecycles are approximately three weeks). Calf deaths can occur 10 to 12 weeks after initial infestation, especially if animals are stressed or underfed.

Treatment

It is not possible to give a blanket recommendation for all farms. Seek advice and assess faecal egg counts to ensure correct treatment. Necessity for treatment and treatment frequency is governed by environmental conditions (rainfall pattern, humidity and temperature), nutrition, age and farm management practice. Accurate dosing of animals when required with appropriate drugs will prevent economic losses due to parasitism and minimise the risk of developing drug resistance by parasites. If drenching for nematodes is warranted, one or two doses six to eight weeks apart during the wet season is usually sufficient. In high rainfall regions e.g. tableland areas, more frequent drenching (four - six weeks) and extra drenching might be necessary. An additional dose in autumn may be advisable if nutrition is declining and in areas where *Ostertagia* is a problem. Although resistance against all the chemical groups has occurred in sheep, no problems have yet been demonstrated in cattle. Anthelmintics based on levamisole, will control most nematodes. Oral drenches with benzimidazoles are effective against nematodes, including *Ostertagia* and some will also control tapeworm. Mectin-type

products (e.g. Cydectin, Dectomax, Ivomec) control most nematodes and some external parasites, may reduce dung beetle populations in frequent use.

Liver and stomach fluke, tapeworm

Liver and stomach fluke may be treated with oxcyclosanide, rafoxanide, closantel or triclabendazole as a single dose when required. Control also involves avoidance - not grazing swampy areas where snails are present, drainage, repair leaking troughs and using other methods to kill the snails. Stock troughs should be routinely cleaned and if host snails are present they may be killed by occasionally adding small amounts of copper sulphate to the water. Not all snails host the parasites. Avoid excess use as copper can be toxic to animals. These drugs (single dose) are effective on tapeworm.

Control methods

Minimal usage of drugs allows the young heifer to build up her immunity to parasites. Control measures aim at reducing worm populations in the environment to an ineffectual level. It is not possible to eliminate them with drugs, nor is it good management to attempt this. Under-treatment results in reduced growth and economic loss even though clinical symptoms may not be apparent. Strategic management - including drenches, paddock rotation with spelling from young stock and adequate nutrition - will allow the heifer to develop her immunity, reduce environment parasite populations and prevent economic loss. It is most important to know what worms are present and in what numbers before commencing worm control programs. Faecal egg counts will determine this.

Table 1. Drench types available, activity and method of application

Drug family	Spectrum of activity	Mode of application
Levamisole (clear drenches) e.g. Nilverm, Ripercol	Broadspectrum anthelmintic - common nematodes but not inhibited stage of <i>Ostertagia</i>	Injection, oral, pour-on
Benzimidazole (white drenches) e.g. Systamex	Broadspectrum anthelmintic - common nematodes including inhibited stage of <i>Ostertagia</i>	Oral, rumen, injection
Macrocyclic lactones (endectocides) e.g. Ivomec, Cydectin, Dectomax	Broadspectrum anthelmintic including <i>Ostertagia</i> , cattle tick, sucking and biting lice, mites	Injection, pour-on
Specific - platyhelminthes (flat worms, fluke) e.g. Fasinex	Liver fluke (all stages)	Oral
Nematodes and platyhelminthes (combinations) e.g. Nilzan LV	Broadspectrum anthelmintic, tapeworm, adult liver fluke, stomach fluke	Oral
Nematodes and platyhelminthes e.g. Ivomec Plus	Broadspectrum anthelmintic, adult liver fluke	Injection

Source: A. Crook, formerly Mallinckrodt Veterinary Ltd.

Hygiene is an essential component in heifer management programmes. For injections, sterilise equipment and swab with alcohol to minimise contamination at injection site.

It is not possible to provide a complete list of products available for animal treatment, changes or new drug treatments. Products listed are examples, they are not exclusive nor recommendations over other (unnamed) products. Users should seek specific advice and current information and make their own decisions as to products and treatments most appropriate to their situation.

Source: Queensland Department of Agriculture, Fisheries and Forestry; 2009