Victorian Farmers Federation
Livestock Group

Livestock Factsheet

➢ Internal Parasites of Cattle

What is an internal parasite?

Internal parasites or 'worms' impact significantly on the production efficiency of Victorian cattle herds, causing disease, reducing growth rates and sometimes causing death. Internal parasites include tapeworms (cestodes), roundworms (nematodes) and flukes (trematodes). Liver fluke and roundworms cause the biggest problems for Victorian producers. These roundworm species include:

- *Ostertagia osteragi* (small brown stomach worm). This worm has the biggest influence on productivity in Victoria.
- *Trichostrongylus axei* (stomach hair worm)
- *Cooperia oncophora* (intestinal worms)
- *Haemonchus placei* (barber's pole worm), found more frequently in northern Victoria.

Why manage internal parasites?

If internal parasites are not managed properly they can cause substantial economic losses. They can impact animal productivity by causing:

- Severe scouring
- Ill-thrift
- Reduced growth rates
- Loss of weight
- Rough coat
- Poor milk production
- Swelling of fluid under the jaw ("bottlejaw") as a result of liver fluke.
- Secondary diseases, such as black disease associated with liver fluke.
- Death

Lifecycle of roundworms

Although there are many different species of roundworms which can infect cattle, their lifecycles are similar (Figure 1). Female worms lay eggs that are excreted in the manure, which then hatch and develop into infective larvae living in the manure. This is known as the first-stage larvae (L1). The larvae then continue to feed on the bacteria in the manure, growing and moulting into second-stage larvae (L2).

The larvae then emerge from the manure onto pasture and are therefore able to infect cattle when ingested with the pasture. This is known as third-stage or infective larvae (L3) or the parasitic stage once the larvae becomes ingested. Adult worms then develop in the abomasum (4th stomach) becoming fourth-stage larvae (L4). Development of larvae into adult worms usually occurs within 3 weeks following ingestion.

Small brown stomach worm (Ostertagia osteragi)

Ostertagia is the most prominent production-limiting species of roundworm in cattle. The gastrointestinal worm is known commonly as the small brown stomach worm. *Trichostrongylus* and *Cooperia* worm species rarely have a severe impact in beef cattle on their own. However, combined with an *Ostertagia* infection, the effects of these worms are increased. The *Ostertagia* life cycle is similar to most other roundworm species; however, it can be delayed, usually due to weather or factors within the animal. Large populations of *Ostertagia* larvae can gather in the stomach wall during late spring and summer, move into a period of dormancy and then resume development

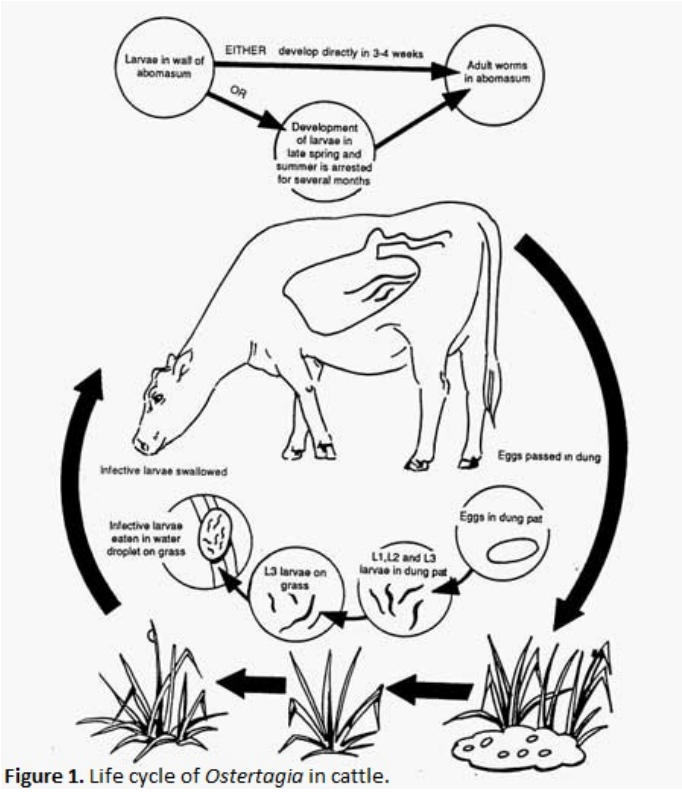

Figure 1. Life cycle of *Ostertagia* in cattle.

and maturation in autumn. If roundworm larvae are not inhibited then development into adult worms can occur within 3 weeks following ingestion. When cattle are infected with *Ostertagia,* damage to the abomasum happens and as a result causes disease. There are two types of disease which develops from *Ostertagia.*

Type 1 generally occurs in young cattle between the ages of 15 and 20 months. The disease develops when cattle accumulate large numbers of infective larvae over a short period of time. Larvae are usually accumulated over 4-8 weeks during winter and spring. The larvae then develop in adult worms which damage the lining of the stomach and affect its function. This results in poor absorption of nutrients causing a decrease in growth rate and loss of weight.

Type 2 disease affects cows calving for the first time or second calvers, in the autumn and winter months. Young heifers calving for the first time are most susceptible however; older cows and bulls may also be infected during autumn or winter. The stress of calving and the development of thousands of dormant larvae into adult worms, intensify the symptoms of disease. Only a few animals in the mob will be affected at any one time, due to the erratic development of dormant larvae. Cattle infected with type 2 disease experience ill-thrift, diarrhoea, persistent weight loss and sometimes death.

Barber's pole worm (Haemonchus placei)

Barber's pole worms are large worms located in the 4th stomach of cattle and are prolific egg layers, laying up to 10,000 eggs per day. Barber's pole worm is frequently found in warm, moist climates, in areas that receive summer rainfall. The worms cause anaemia by sucking the blood from the lining of the stomach and if present in large numbers can kill the animal.

This worm is found more in northern Victorian cattle herds and tends to infect calves more frequently than cows.

Life cycle of liver fluke

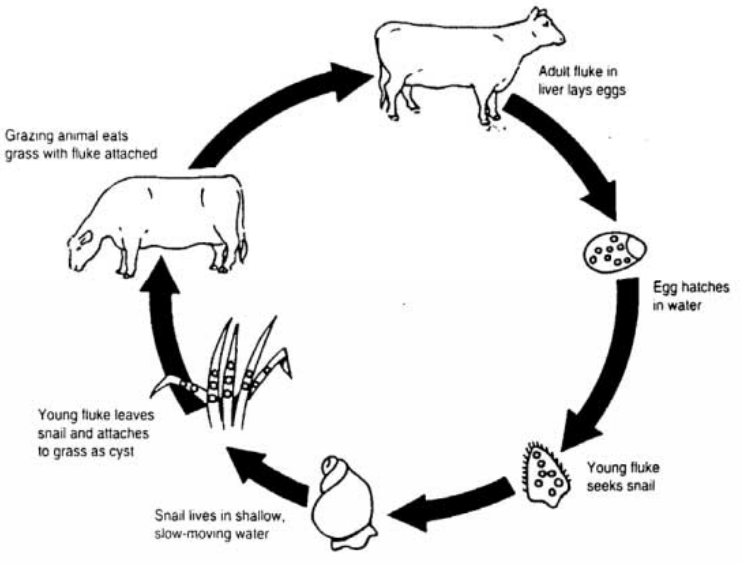

Figure 2. Life cycle of liver fluke (*diagram courtesy of DPI Victoria).*

Liver fluke has an indirect life cycle (Figure 2). This means that it requires more than one host species to complete its life cycle. The major host for liver fluke is the freshwater snail, *Lymnaea tomentosa.* Therefore, liver fluke generally occurs in areas favourable to the snail such as marshy areas, creeks and irrigation areas.

Adult flukes found in the bile ducts of infected animals produce eggs which are excreted in the faeces. During warm, favourable conditions the eggs detach from the faecal matter and hatch in wet areas. The larvae then enter the snail and begin to develop and multiply. The larvae in the snail develop into tadpole-like forms known as *cercariae*. At this point, the *cercariae* leave the snails and attaches themselves to pastures as cysts. The parasite-host cycle in the snail generally runs its course over two to three months.

Cattle then consume the fluke cysts along with the pasture, where the immature flukes infiltrate the intestinal wall into the abdominal cavity. The immature flukes move through the liver tissue for six to seven weeks before entering the bile ducts, where they develop into mature adult flukes. Maturation and egg production usually occurs eight to ten weeks after the animal has consumed the fluke-infected pasture.

Integrated Parasite Management

Producers should utilise both 'chemical' and 'non-chemical' options when developing an approach to worm control. 'Non-chemical' approaches include providing adequate nutrition and low risk pastures for young cattle. Chemical approaches include the use of drench.

Grazing and nutrition management

Animals that are provided with adequate nutrition are able to cope with worm burdens better. They are better able to endure the symptoms of worms, increasing the rate of recovery. Grazing cattle, particularly young stock, on lower risk pastures will enhance the efficacy of drenching. Lower risk pastures are pastures that have low numbers of infective larvae (L3). These pastures include:

- Pastures which have been rotationally grazed between sheep and cattle. Worms are generally host-specific.
- Pastures that have not been previously grazed by any cattle for at least 4 months.
- Newly sown pastures

Drenching for worms

There are three groups of drenches commercially available for the treatment of worms. Application varies from pour-on, injection and oral drench and may impact the effectiveness of the drench. Oral drenches may be less effective if they go directly into the abomasum and bypass the rumen of the individual animal. Combinations of drench groups are not required as drench resistance in cattle is low, unlike the resistance in the sheep industry. However there is increasing evidence of drench resistance in cattle so it is vital to use an effective drench correctly. It is important when selecting a drench that particular attention is paid to storage and handling instructions, dosage requirements and withholding periods and export slaughter interval. The three groups of drenches for worm control in cattle include:

- Group 1 (Benzimidazole or white drenches) - These mainly consist of oral drenches and may be less convenient than pour-on drenches. Withholding periods are generally shorter than the group 3 drenches.
- Group 2 (Levamisole or clear drenches) – These drenches are generally cheaper however can be less effective against dormant *Ostertagia* and therefore not recommended for use during December and May.
- Group 3 (Macrocyclic lactone or Mectin drenches) – This group is the most effective group against all stages of worms. They mainly come in the form of pour-on or injectable drenches and generally have longer withholding periods.

The suggested drenching program for autumn calving beef herds in Victoria is:

- December/January- weaners, first and second calvers.
- March/April- weaners, first-calf heifers and bulls.
- June/July- bulls, weaners and provide cattle with low risk pastures. First and second calvers may need to be treated if body condition is poor or they are scouring.

The suggested drenching program for spring calving beef herds in Victoria is:

- January- First-calf heifers, second calvers and bulls.
- February to April- weaners
- July/August- bulls and first and second calvers in low body condition pre-calving.

Older cows rarely require treatment after their second calving, however cows that are scouring or 'poor doers' should be drenched. The above programs are only suggestions; time of drenching can be influenced by seasonal conditions, pasture availability, low body condition scores, calving patterns and the worm history on a particular property. To improve the efficacy of drenching, producers should include improved nutrition and grazing practices as part of their overall worm management strategy. It is recommended that you contact the product advisor or your local veterinarian on the best drench practice for your herd.

A worm egg count (WEC) can be conducted on the manure from young stock to detect worm burdens and drench efficacy. Cattle under 12 months of age are required for this test, as they are the most susceptible to worms. A second test should be conducted two weeks after drenching to determine the effectiveness of the drench treatments. Contact your local veterinarian or DPI office to arrange for a WEC.

Control of liver fluke

Control of liver fluke is best achieved by drenching. Drench programs will be influenced by rainfall patterns, temperatures and degree if fluke infestation. In heavily infested areas, disease usually occurs in late spring and early summer. This is when the first drench is generally required. A drench containing the active ingredient triclabendazole is recommended as it is effective against immature fluke. In areas where fluke infestation is less significant, disease may not occur until the autumn when cattle in search of green pick, graze springs and wet areas.

High risk periods for liver fluke generally correlate with the host snail's breeding period. The breeding season for the snail is in autumn and spring; this means that treatment is best administered before the commencement of these breeding periods. In general, beef cattle in Victoria should be drenched for fluke in March and July.

In Victoria, liver fluke resistance to triclabendazole occasionally occurs and it is recommended that producers rotate between drenches containing different active ingredients, every one to two years. Combinations of drenches such as triclabendazole and ivermectin may be used to control flukes and roundworms. When using drenches, attention needs to be given to storage and handling instructions, dosage requirements and withholding periods. A 'fluketest' can be conducted to detect fluke eggs in faecal samples and to establish the rate of mature fluke infestation.

Cattle herds situated in areas where liver fluke occurs should be vaccinated for black disease. Black disease is a fatal liver disease caused by liver damage associated with the movement of young flukes through the liver tissue. The damage provides the right environment for the incubation of bacterial spores in the liver. Most commercially available vaccines incorporate a 5 in 1 defence, protecting against black disease as well as other diseases. Contact the product advisor or your local veterinarian

to establish an effective fluke control program or to arrange for a fluketest.

For further information, please contact the VFF Livestock Group on 1300 882 833 or by email to Jacinta Pretty at jpretty@vff.org.au

Further Links

Department of Primary Industries Victoria
http://www.dpi.vic.gov.au/agriculture/pests-diseases-and-weeds/animal-diseases/beef-and-dairy-cows/ostertagia-in-cattle
http://www.dpi.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-insects/liver-fluke

Department of Primary Industries New South Wales
http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/146693/cattle-worm-control-the-basics.pdf

The Mackinnon Project
http://www.mackinnonproject.com.au/index.php?option=com_content&view=article&id=13&Itemid=1

Meat and Livestock Australia
http://www.mla.com.au/Livestock-production/Animal-health-welfare-and-biosecurity/Parasites/Identification/Liver-fluke

Original Author, Jacinta Pretty (VFF Livestock Project Officer), Original Version Published in April 2013.

Take Home Messages

- Internal parasites or 'worms' impact significantly on the production efficiency of Victorian cattle herds, causing disease and sometimes death.
- *Ostertagia* is the most prominent production-limiting species of roundworm in cattle.
- Producers should utilise both 'chemical' and 'non-chemical' options when developing an approach to worm control.

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