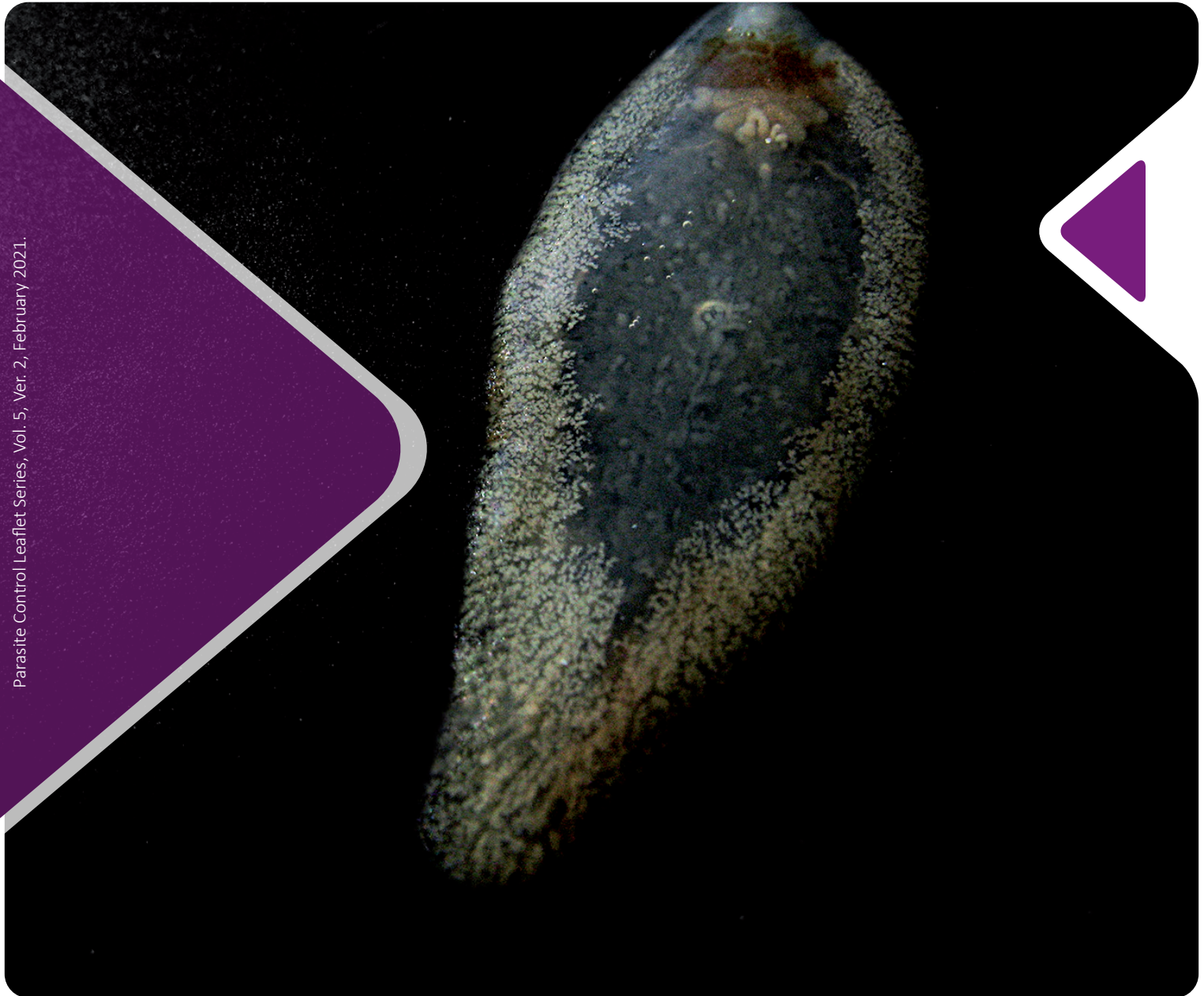


Liver Fluke - The Facts

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Contributing to a profitable and sustainable farming and agri-food sector through improved animal health

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Introduction

Liver fluke disease or fasciolosis is a parasitic disease of grazing animals caused by a flat worm (*Fasciola hepatica*) and is economically important in cattle, sheep and goats.

Liver fluke disease causes annual losses estimated to be around €2.5 billion to livestock and food industries worldwide, and is estimated to cost at least €90M to the Irish industry. Economic losses caused by liver fluke are mainly associated with a decrease in meat and milk production. Depending on the degree of infection, liver fluke may cause a reduced meat production of up to 20% in cattle and up to 30% in sheep, and a reduction in milk production of up to 8% in cows. Fertility can suffer and beef cattle affected by fluke may take an extra 80 days to reach market weights. Losses also occur due to the number of livers condemned in meat plants as up to 50% of livers may be condemned.

Severe infection may cause death due to anaemia in young animals, particularly in lambs. Liver fluke can occasionally result in sudden death by triggering certain clostridial diseases of cattle. More recently, evidence has emerged that liver fluke infection and may also exacerbate other infectious diseases such as salmonellosis and Tuberculosis. The prevalence of liver fluke infection has increased up to 12-fold in certain EU Member States (including Ireland) during recent years.

Life cycle

Animals are infected by ingesting encapsulated larvae (metacercariae) on contaminated grass. Typically, individual farms will have wet 'flukey areas' that should not be used or grazed at times of the year when metacercariae are likely to be present, i.e. late summer to winter (depending on climatic conditions). However, cattle and sheep often graze on such areas. Therefore, it cannot be assumed that liver fluke infection is absent from any area of Ireland.

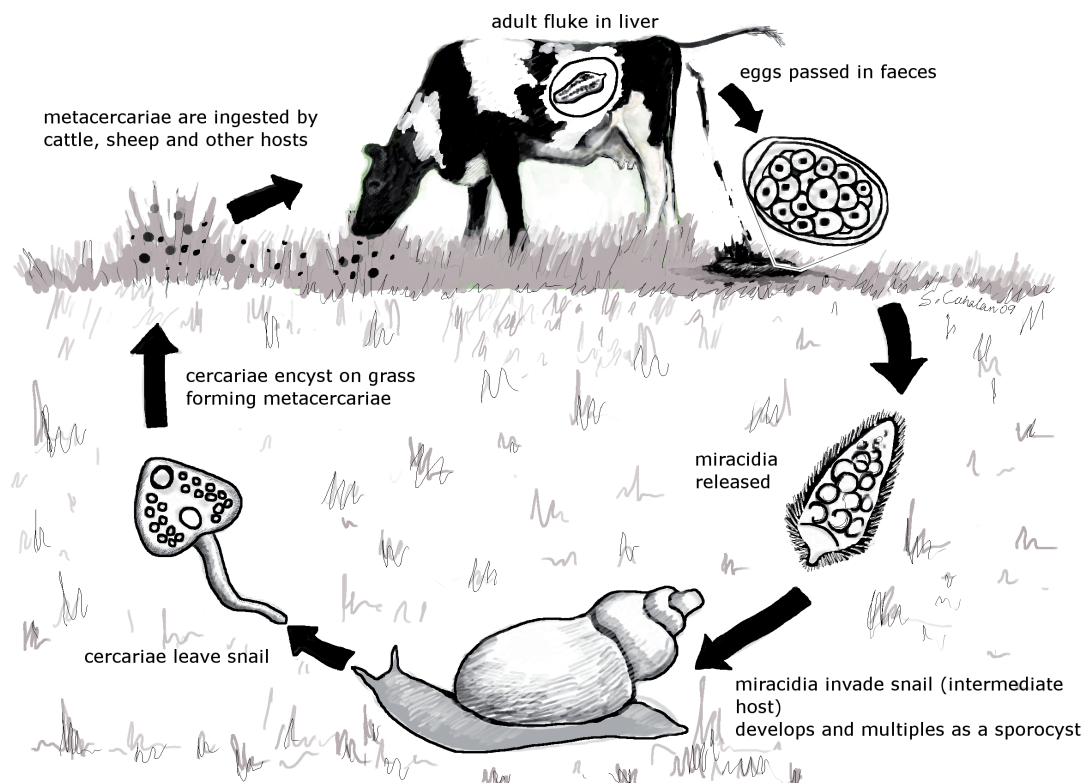


Figure 1. Liver fluke life cycle.

Figure 1 illustrates the life cycle of Liver fluke, which depends on an external host as well as cattle or sheep. In the bowel, the larvae are freed from the cysts, penetrate the intestinal wall and move to the liver.

In the liver they travel for 8-12 weeks causing significant liver damage. Immature flukes reach the bile ducts where they mature into adults and in the absence of treatment, they may live for months in cattle and years in sheep, feeding on blood and producing thousands of eggs that are released with the bile into the small intestine, finally reaching the pasture in the faeces.

In the egg, a small larval stage (miracidium) develops that, after leaving the egg, must penetrate a snail (the so-called liver fluke snail or mud snail). In the snail the larva grows via the sporocyst and reidia stages.

Finally 500-1000 larval stages (cercariae) leave the snail and settle on the grass as encapsulated infective larvae (metacercariae).

What are the signs that liver fluke infection may be in your herd?

Animals may show a variety of obvious signs such as oedema (dropsy) under the jaw (bottle jaw), anaemia, poor coat condition and lack of appetite. Liver fluke infestation can cause decreased fertility and wool production. However, the animal with weight loss and bottle jaw represents the 'tip of the iceberg'. Detection of subclinical infection with its adverse effect on growth rate, milk yield and fertility requires diagnostic tests such as blood tests (elevated globulins, low albumins, elevated GGT) and assessment of faecal egg counts.

Diagnostic data relating to liver condemnation collected at abattoirs is invaluable and bulk milk testing may be used to confirm that infection is present in dairy herds, but the latter method should be backed up by faecal egg counting prior to initiation of a dosing programme.

Liver fluke infection can be a problem all year round. However, most infections occur during the winter, as a result of infections acquired in the autumn from snails that build up over the summer on pastures. Occasionally, snails become infected in the autumn and may hibernate over winter. They will then shed infection onto the pasture the following spring thus infesting animals early in spring time. Most herds in show evidence of infection, with prevalence greatest in the West of Ireland.



Mature liver flukes in gall bladder of an infected animal

Recommendations for control

- Improve drainage and fence-off wet areas with poor drainage, where possible.
- Reasonable measures should be taken to prevent poaching and avoid grazing 'flukey areas' particularly when metacercariae are likely to be present.
- Dose bought-in animals with an appropriate flukicide before introducing to pastures. All bought-in animals should be quarantined for at least 4 weeks after arriving on farm- see the AHI *Biosecurity Purchasing Stock Guidelines* for more information on quarantining of newly arrived animals.
- A strategic dose, in early- mid summer, designed to reduce the number of snails becoming infected, is also recommended.
- Fluke burdens can be monitored by using a combination of faecal egg counts, bulk milk ELISA and data relating to liver condemnations from the factory. Discuss these results with your vet to ensure your control strategy is effective and appropriate.
- Dose animals, where possible, at housing, and if required, again 4-6 weeks after housing- refer to the AHI leaflet *Parasite Control at Housing* for more information on treatment at this time.
- Treatment of dairy cattle is a particular problem. Dosing with an authorized product during the dry period should be considered. See below regarding withholding periods.
- Heed the annual DAFM liver fluke forecast, issued in autumn each year <http://www.agriculture.gov.ie>.

Bulk milk testing

Bulk Milk ELISA Testing may be used as an additional surveillance tool on dairy farms - but the data needs to be interpreted carefully in association with other diagnostic information on farm such as results from faecal testing and details on liver condemnations from the farm.

Is resistance a problem?

The control of liver fluke in livestock is mainly based on the use of drugs (flukicides), either preventively/routinely, as well as in the treatment of individual clinical cases. Table 1 gives a listing of drugs licensed for control of liver fluke in cattle in Ireland.

The inappropriate use or overuse of some flukicides such as triclabendazole has led to the emergence of resistant strains of *F. hepatica*, this has been reported in several countries including Ireland, the Netherlands and the U.K. Therefore, annual rotation of anthelmintics, plus post-treatment assessment of effectiveness of dosing should form part of fluke control programmes. Consult with your veterinary practitioner as to the best strategy for your farm.

Withdrawal periods

In all cases, milk and milk withdrawal periods must be strictly observed. Be particularly aware of flukicide restrictions in milking cows and heifers due to produce milk for human consumption.

ACTIVE INGREDIENT	LIVER FLUKE STAGE		
	EARLY IMMATURE	IMMATURE	MATURE
Triclabendazole* *	✓	✓	✓
Closantel*		✓	✓
Clorsulon*			✓
Oxyclozanide			✓
Nitroxynil*		✓	✓
Rafoxanide*		✓	✓
Albendazole			✓

Table 1. Examples of drugs useful in control of liver fluke in cattle.

* The IMB in March 2010 ruled that “Veterinary medicines containing these substances should not be used in dairy animals intended for milk production, including pregnant heifers intended for milk production for human consumption.” This ruling may change. Please consult www.imb.ie for further updates. Combination products are also available on the market targeting a combination of fluke and worms.

** Some formulations have now been approved for use in cows producing milk for human consumption.



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