



Control of Liver Fluke

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Liver fluke is an internal parasite of sheep and cattle.

It can cause severe production losses and death in stock in those areas of Victoria which are suitable for its other host, the small freshwater snail *Lymnaea tomentosa* to survive.

Damage may initially be caused by the immature stages of the fluke migrating through the animal's liver ("acute" liver fluke disease). These immatures develop into adults which suck blood from the lining of the bile ducts, causing significant blood loss and liver damage in heavy infestations ("chronic" liver fluke disease).

In **sheep**, the "acute" disease is seen as sudden weakness and death. The "chronic" form is more common, in which case sheep lose condition, develop a soft fluid swelling under the jaw ("bottle jaw"), become weak and may die. Closer examination will reveal pale eye linings and gums caused by the loss of blood.

In **cattle**, the "chronic" disease is more common and is similar to that seen in sheep. Affected cattle have rough coats which become pale in breeds, such as Herefords, that have red coats. Weight loss, poor milk production, "bottle jaw", anaemia and chronic diarrhoea are all symptoms of chronic fluke infestation. The "acute" form has been seen in dairy calves exposed to massive numbers of immature fluke.

Black disease, a member of the clostridial family of diseases, can cause sudden death as a result of the clostridial bacteria multiplying in areas of the liver damaged by migrating immature liver fluke. This disease causes sudden death.

Control of Liver Fluke

Eradication of liver fluke is almost impossible because it is usually not practical to prevent reinfestation of pastures and animals. Fortunately, good control can be achieved by the strategic use of drenches which kill different stages of the liver fluke combined where possible with snail control.

Drenching

The optimum drenching program will depend on the degree of infestation, rainfall pattern and the drench used. In south-east Australia, pick up of infective larvae usually

commences in spring and may continue through summer on irrigation properties or areas with springs and soaks which favour snail survival. In average winters, snail numbers are significantly reduced and pick up of immature fluke diminishes. However in mild winters, snail activity, and hence fluke infection, may continue.

"Acute" disease can occur in late spring and early summer in heavily infested areas. This may be when the first drench is required, using a drench such as those containing triclabendazole which is highly effective against the immature fluke. In other areas, significant infestation may not occur until the autumn when stock graze the springs in search of a green pick, so a drench may not be required until then.

A general recommendation would be to drench sheep in February and July and cattle in April/May and July. Dairy cows in flukey areas are commonly treated at drying off. In extremely flukey areas and on irrigation properties, extra drenches for sheep may be required in December and April. It is strongly recommended that you seek the advice of an animal health adviser in your area to formulate an appropriate drench program for your farm. This program may change slightly from year to year depending on temperature and rainfall patterns. Tables 1 to 3 provide details on drenches for liver fluke for cattle, sheep and goats.

Drench resistance. Liver flukes resistant to triclabendazole occur on some Victorian farms. Consider rotating from one flukicide to another flukicide containing a different active ingredient each one to two years. Seek veterinary advice for diagnosis and delaying drench resistance. Combination products effective against both liver fluke and roundworms are available. Limit the use of these products to when treatment of both liver fluke and roundworms is required.

Mature fluke infestation can be monitored by the use of laboratory tests such as "Fluketest" which will detect fluke eggs in faecal samples. Bulk milk and blood tests to detect immature as well as mature liver fluke infection are available in some areas.

Control of Snails

Liver fluke snails are about 6 to 12 mm long and the shell has a clockwise or "right hand" thread when viewed from the point to the base of the snail. If you can drain swampy areas or convert them into deeper, quickly moving water, snails and the liver fluke lifecycle will be greatly reduced. It is often very difficult and expensive to do this but it may be practicable to fence off areas which are known to harbour liver fluke snails. Tree planting in wet areas could also be considered, as the fluke snail doesn't live in areas which have a dense cover of vegetation.

In irrigation areas, snails breed in the channels, particularly drainage channels, and they can be spread over the pasture during irrigation. This habitat is nearly ideal for the snail but it is difficult to change. Improve drainage in wet areas.

Chemicals available for control of snails are very long-lasting and can kill other forms of life, including fish. Their use cannot be recommended.

Vaccination

All stock in fluke areas should be vaccinated against black disease. You can immunise against black disease using 5 in 1 vaccine.

Other Diseases Confused with Liver Fluke Infection

Infection with Barber's Pole worm can be difficult to distinguish from fluke infestation. Faecal worm egg testing and post mortem examination may be required for an accurate diagnosis.

Further Information

Boray JC (1999). Liver fluke disease in sheep and cattle. Primefact 446, revised by Dr GW Hutchinson and Stephen Love (March 2007). NSW DPI.

http://www.dpi.nsw.gov.au/aboutus/resources/factsheets/p_rimefacts/liverfluke-disease-sheep-cattle

Lloyd JB, Boray JC and Campbell NJ (2003). Identifying liver fluke snails. Primefact 476. NSW DPI.

<http://www.agric.nsw.gov.au/reader/sheep-internal>

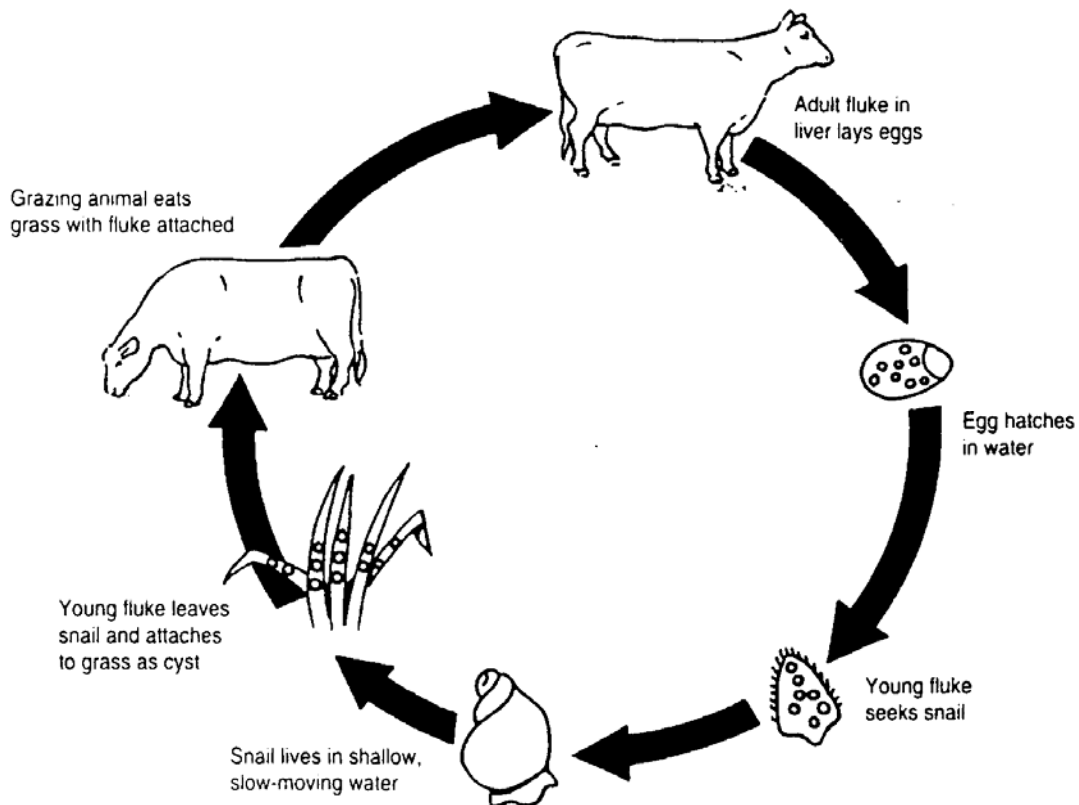


Figure 1. Life-cycle and control of liver fluke

Table 1. Treatments for liver fluke in cattle

Chemical Name	Representative brand names	Method of application	Withholding periods (days)		Efficacy against liver fluke ³	Comments See product label for full claims and restraints
			Meat ¹	ESI ²		
Albendazole	Valbazen mini-dose cattle, Strategik mini-dose (cattle), Albendazole cattle mini-drench, Nuwhite CC	Oral	10	10	+	Aids in the control of adult liver fluke when used at the recommended fluke dose rate. For the control of BZ-sensitive mature & immature gastrointestinal roundworms, lungworms and tapeworms.
Levamisole + Oxytocanide	Nilzan LV	Oral	14	14	+	Suitable for use in cows producing milk for human consumption. For the control of levamisole susceptible round worms and liver fluke in cattle and sheep.
Triclabendazole	Fasinex 100 oral, Flukare C, Tremacide 120, Tricla 120, Faxinex 240, Tricla 50, Flukare S	Oral	21	56	+++	For the treatment of susceptible early immature, immature and mature liver fluke in sheep, cattle and goats (some products).
Triclabendazole + Ivermectin	Fasimec C, Triclamec C,	Oral	21	56	+++	For the treatment of triclabendazole-sensitive early immature, immature and mature liver fluke in cattle. For the treatment and control of ivermectin-sensitive strains of roundworms and lungworm and sucking lice in cattle.
Triclabendazole + Oxfendazole	Flukazole C	Oral	21	Not established	+++	For the control of benzimidazole-sensitive mature and immature roundworms, lungworms, tapeworms and early immature, immature and mature liver fluke in cattle
Nitroxylnil	Trodax	Subcutaneous injection	28	28T	++	For control of late immature and mature liver fluke.
Ivermectin + Clorsulon	Ivomec plus, Virbamec plus injection	Subcutaneous injection	28	42	+	Suitable for use in cows producing milk for human consumption. For the treatment and control of ivermectin and clorsulon sensitive strains of internal and external parasites of cattle including adult liver flukes.
Ivermectin + Clorsulon	Genesis ultra injection, Vetmec F	Subcutaneous injection	28	42	+	For the control and treatment of roundworms, adult liver fluke and external parasites in beef cattle.
Abamectin + Triclabendazole	Genesis ultra pour-on, Fasimec cattle pour-on, Triclamec cattle pour-on	Pour-on	49	140	+++	For the treatment and control of roundworms, liver fluke (all 3 stages) and external parasites of beef cattle.
Ivermectin + Triclabendazole	Sovereign	Pour-on	28	70	+	For the treatment and control of ivermectin-sensitive gastro-intestinal roundworms, lungworm and adult liver fluke of cattle.

The above table is to be used as a guide only. Always read and follow the label directions.

For detailed information on the registered products contact the chemical manufacturer, your local veterinarian or DPI animal health staff.

Footnotes to Table 1

Most products can not be used in lactating cows where milk or milk products may be used for human consumption. Some products can not be used within 3 to 4 weeks before calving where milk or milk products may be used for human consumption. Please check the label.

¹The *withholding period* (WHP) is the minimum period which must elapse between the last administration or application of an agricultural or veterinary chemical product, including treated feed, and the slaughter, collection or harvesting for human consumption or use of the animal commodity. The withholding period is a statutory requirement and on the label of every registered product.

²The *export slaughter interval* (ESI) is the minimum **suggested** time interval that should elapse between the last application of a drug or veterinary chemical to an animal, and their slaughter for **export**. T: ESI is under review and final ESI may be longer.

³ Effective against adult fluke (+), immature and adult fluke (++) , early immature, immature and adult fluke (+++).

Information sources: Infopest CD Nov 2006 (© Qld DPIF), APVMA (<http://www.apvma.gov.au>) 14 Feb 2007.

Table 2. Liver fluke treatments for sheep

Chemical Name	Representative brand names	Withholding periods (days)		Efficacy against liver fluke ³	Comments See product label for full claims and restraints
		Meat ¹	ESI ²		
Albendazole	Rycoben, Nemadet, Alben, Albendazole (sheep, lamb & goat), Valbazen sheep lamb & goat drench, Strategik 25	10	10	+	Aids in the control of adult liver fluke when used at the recommended fluke dose rate. For the control of susceptible gastrointestinal roundworms and lungworms, tapeworm.
Closantel	Closantel (4farmers), Closantel (WSD), Closcicare, Closamax, Seponver Se, Sustain + Se	28	60T	++	Sustained control of barber's pole worm and immature and mature liver fluke. For the sustained control of barber's pole worm and control of liver fluke and nasal bot in sheep.
Albendazole + closantel	Closal, Caddy	28	60T	++	For the control of Closal susceptible mature and immature gastrointestinal roundworms, lungworms, tapeworms, nasal bots, liver fluke
Abamectin + closantel	Genesis xtra drench	49	84	++	For the control & treatment of roundworms, nasal bot, itch mite & mature & late immature liver fluke in sheep
Closantel + oxfendazole	Closicomb, Rotafluke	28	60T	++	For the control of susceptible mature and immature gastrointestinal roundworms and tapeworms, lung worms, liver fluke including 4 week old immature stages, nasal bots
Abamectin + levamisole + closantel + albendazole	Q-drench	28	Not established	++	For the treatment and control in sheep of susceptible gastrointestinal roundworms. It is also effective against lungworm, tapeworms, mature and late immature liver fluke, nasal bot and itch mite.
Levamisole + oxclozanide	Nilzan LV	14	14	+	For the control of levamisole susceptible round worms and liver fluke in sheep and cattle, also assists in the removal of tapeworm segments in sheep and lambs.
Nitroxylnil	Trodax (injection)	28	28T	++	Subcutaneous injection. For control of nitroxylnil sensitive strains of late immature and mature liver fluke and barber's pole worm.
Triclabendazole	Fasinex 100 oral, Flukare C, Flukare S, Tremacide 120, Tricla 120, Flukeguard S, Tricla 50	21	63	+++	For the treatment of susceptible early immature, immature and mature liver fluke in sheep, cattle and goats (some products).
Moxidectin + triclabendazole	Cydectin plus fluke	21	63	+++	For the treatment and control of moxidectin sensitive gastrointestinal parasites, lungworm, itchmite and triclabendazole sensitive strains of liver fluke of sheep.
Triclabendazole + abamectin	Flukamec	21	63	+++	For the control of abamectin-sensitive strains of internal parasites, itch mite, nasal bot and early immature, immature and mature liver fluke in sheep.
Triclabendazole + ivermectin	Fasimec sheep, Paramax-F, Triclamec sheep,	21	63	+++	For the treatment of triclabendazole-sensitive early immature, immature and mature liver fluke in sheep. And control of ivermectin-sensitive strains of roundworms and lungworm, nasal bot and itch mite in sheep.
Triclabendazole + oxfendazole	Flukazole S	21	63	+++	For the control of benzimidazole-sensitive mature and immature roundworms, lungworms, tapeworms and early immature, immature and, mature liver fluke in sheep.

The above table is to be used as a guide only. Always read and follow the label directions.

For detailed information on the registered products contact the chemical manufacturer, your local veterinarian or DPI animal health staff.

Footnotes to Table 2

No products are registered for use in lactating ewes where milk or milk products may be used for human consumption. Seek veterinary advice.

¹ The *withholding period* (WHP) is the minimum period which must elapse between the last administration or application of an agricultural or veterinary chemical product, including treated feed, and the slaughter, collection or harvesting for human consumption or use of the animal commodity. The withholding period is a statutory requirement and on the label of every registered product.

² The *export slaughter interval* (ESI) is the minimum **suggested** time interval that should elapse between the last application of a drug or veterinary chemical to an animal, and their slaughter for **export**. T: ESI is under review and final ESI may be longer.

³ Effective against adult fluke (+), immature and adult fluke (++), early immature, immature and adult fluke (+++).

Table 3. Liver fluke treatments for goats

Chemical Name	Representative brand names	Withholding periods (days)		Efficacy against liver fluke ³	Comments See product label for full claims and restraints
		Meat ¹	ESI ²		
Albendazole	Nemadet, Alben, Albendazole (sheep, lamb & goat), Valbazen sheep lamb & goat drench	10	10	+	Aids in the control of adult liver fluke when used at the recommended fluke dose rate. For the control of susceptible gastrointestinal roundworms and lungworms, tapeworm.
Triclabendazole	Fasinex 100 oral, Flukare C, Flukare S, Flukeguard S, Tricla 50	21	63	+++	For the treatment of susceptible early immature, immature and mature liver fluke in sheep, cattle and goats

The above table is to be used as a guide only. Always read and follow the label directions.

For detailed information on the registered products contact the chemical manufacturer, your local veterinarian or DPI animal health staff.

Footnotes to Table 3

No products are registered for use in lactating goats where milk or milk products may be used for human consumption. Seek veterinary advice.

¹The *withholding period* (WHP) is the minimum period which must elapse between the last administration or application of an agricultural or veterinary chemical product, including treated feed, and the slaughter, collection or harvesting for human consumption or use of the animal commodity. The withholding period is a statutory requirement and on the label of every registered product.

²The *export slaughter interval* (ESI) is the minimum **suggested** time interval that should elapse between the last application of a drug or veterinary chemical to an animal, and their slaughter for **export**.

³ Effective against adult fluke (+), immature and adult fluke (++), early immature, immature and adult fluke (+++).

The previous version of this Information Note was published in June 1995.

The advice provided in this publication is intended as a source of information only. Always read the label before using any of the products mentioned. The State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.