

LIVER FLUKE CHALLENGES

Dr Johan Cloete

Liver fluke infections may cause severe economic losses to producers and are difficult to eradicate.

"How does one manage liver fluke then?", would be an appropriate question to ask. It is very important to first understand how the parasite's life cycle functions. When one understands the damage inflicted by the parasite, it also assists to manage the parasite effectively.

Life cycle

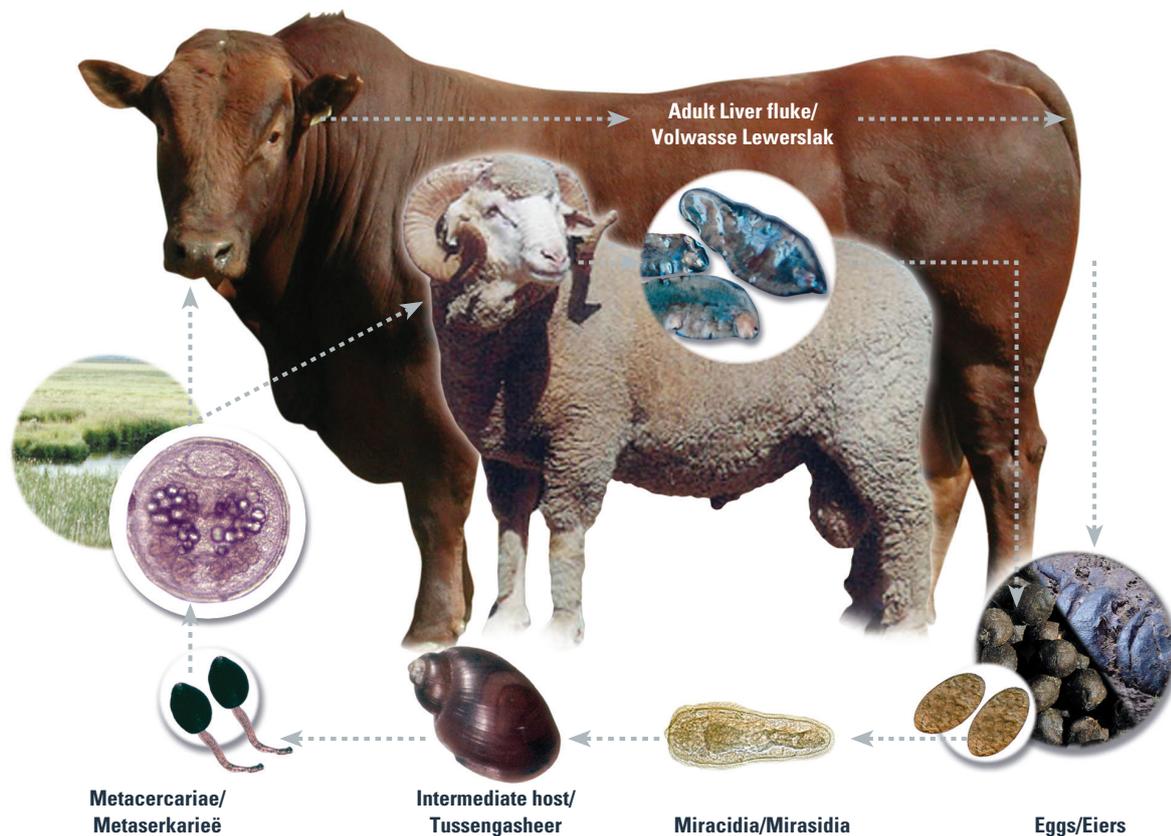
There are two important species of liver flukes that affect livestock and game in South Africa, namely *Fasciola hepatica* (normal liver fluke) and *F. gigantica* (giant liver fluke). Both species have three life cycle stages that they evolve through to ensure their survival.

- Adult flukes which shed eggs
- Miracidium
- Metacercaria

1. Adult liver flukes lay eggs that are passed into the bile ducts to exit via the gall bladder into the small intestines from where they are passed out via the dung.

2. When cattle defecate in areas with adequate moisture, the miracidium are released from the egg and swim to acceptable fresh water snails which they penetrate to continue the next stage of their lifecycle. The miracidium needs to penetrate a snail within 8-10 hours.
3. In the fresh water snail, the miracidium develops into cercaria. Cercaria are released in their thousands from the infected fresh water snails. This is triggered in the cooler autumn and encroaching winter months. The cercaria move to grass and other organic material nearby where they encyst into a metacercaria form. This stage is protected within a small hardened little capsule whereby they survive against the harsh cold climate and external factors. They can remain viable in this format for many months.
4. The protected minute sized metacercaria is ingested with the grass and other roughage that the ruminant consumes when grazing near marshes, rivers, water troughs and other moist water sources in grazing paddocks. Ruminants may even become infected from consuming metacercaria contaminated grass or algae on the inside of the water troughs.
5. The metacercaria are released from the encysted capsule after passing through the acid environment of the stomach, causing the capsule to soften. These small infective immature liver flukes then migrate through the intestinal wall to the nearby liver.

LIVER FLUKE LIFE CYCLE / LEWERSLAK LEWENSIKLUS



6. As the immature liver fluke migrates through the liver tissue, the flukes ingest blood from the liver and defecates in the migration tracts. These migration tracts can frequently be observed under the surface of the liver capsule in ruminants such as cattle, sheep, goats and game species and are also visible within the deeper lying liver tissue when a liver incision is performed during an abattoir inspection or during a post mortem examination. Prior to maturation the immature liver flukes migrate to the gall ducts where they start to consume large amounts of blood from the bile duct tissue.
7. The immature *F. hepatica* takes about 6-8 weeks to reach sexual maturity compared to the 10-12 weeks required by *F. gigantica*. When they reach sexual maturity they start to produce eggs. The liver fluke is a hermaphroditic parasite, meaning it contains both male and female reproductive organs and 'self-fertilizes' its eggs.
8. The liver fluke eggs are first passed from the bile ducts to the gallbladder. From the gallbladder they are passed to the small intestine from where they are excreted in the dung. The eggs may start to hatch immediately if the moisture and environmental heat conditions are acceptable or remain there until these required conditions occur in the summer months. Once the miracidium stage hatches the life cycle repeats itself again.

Damage and symptoms caused by liver flukes

In the process whereby the immature liver flukes migrate through the liver they are able to create favourable anaerobic micro-conditions wherein especially anaerobic bacteria such as the *Clostridium* spp. can multiply to cause disease. Diseases such as dry, moist or gas gangrene may arise due to the following bacterial species *C. chauvoei*, *C. septicum* or *C. sordellii*.

Blood deficiencies in the form of visible bottle jaw, as well as anaemic mucous membranes of the eyes and mouth may manifest as clinical signs. In addition to this, diarrhoea, emaciation, weakness and even death may occur in sheep, goats and cattle.

The most common chronic pathological symptoms that occur are hardening of the bile ducts through irritation from the parasites which result in calcification of the liver bile ducts. The parasite migrations and bile duct calcifications may also result in the liver becoming distorted in shape and the tissue may become hardened in general. This may lead to a deficiency in functionality of the liver similar to liver cirrhosis.

In infected livestock losses in terms of production and reproduction may be observed. Death of livestock may also occur resulting in direct financial losses. Generally small stock such as sheep are more susceptible to the effects of liver fluke infestations.



1 ORAL REMEDY AGAINST LIVER FLUKE: FLUXACUR NF

INDICATIONS: **FLUXACUR NF** is an antiparasitic remedy for the control of internal parasites of cattle, sheep and goats, for the control of nasal worm in sheep and goats and itch mites on sheep, additionally a liver fluke remedy against early immature and mature liver fluke and giant liver fluke in cattle, sheep and goats.



COMPOSITION:

Contains 0,2 % *m/v* abamectin and 10 % *m/v* triclabendazole. The active ingredient triclabendazole is effective against liver fluke. More specifically it is effective against immature liver flukes from 2 weeks of age in *F. hepatica* and from 3 weeks in *F. gigantica*, as well as against the adult stages at 12 weeks of age.

APPLICATION: The remedy is administered as an oral application at a dose rate of 1 mL/10 kg live body mass.

2 INJECTABLE REMEDY AGAINST LIVER FLUKE: IVOTAN® SUPER

INDICATIONS: **IVOTAN® SUPER** is an injectable, combination endoparasitic remedy for cattle.



COMPOSITION: Contains 1,0 % *m/v* ivermectin and 10 % *m/v* clorsulon.

The active ingredient clorsulon is effective against adult liver fluke. The target parasite species are:

- Liver fluke
- False bruising caused by *Parafilaria* spp.
- Eye worm

APPLICATION: The remedy is administered as an injectable at a dose rate of 1 mL/10 kg live body mass.

After treatment it is advisable to allow approximately a 70 day period for liver lesions to recover or be reduced.

FLUXACUR NF Reg. No. G3202 (Act 36/1947) Namibia Reg. No. V03/18.1.8/679
IVOTAN® SUPER Reg. No. G4368 (Act 36/1947)

Intervet South Africa (Pty) Ltd. Reg. No. 1991/006580/07
20 Spartan Road, Spartan, 1619, RSA. Private Bag X2026, Isando, 1600, RSA
Tel: +27 (0) 11 923 9300. **Fax:** +27 (0) 11 392 3158. **Sales fax:** +27 (0) 86 603 1777
www.msd-animal-health.co.za | ZA-IVO-200600001