

Liver fluke- tackling the problem of resistance with a range of solutions

Fasciola hepatica, or liver fluke, is now considered to be endemic in certain areas of the UK, especially in the wetter regions, such as Wales and north-west England¹. Additionally, in spite of our increased knowledge of liver fluke, the prevalence of this parasite is still on the increase. Climate change may be contributing to this increase, with many wet summers and considerably warmer winters leading to increased survival of fluke and their intermediate host, the mud snail, on pastures. Intensification of farming practices, increased animal movements and an increase in drug resistance has also been implicated.

The incidence of fluke disease diagnosed post-mortem in cattle and sheep has increased year on year (VIDA), and is estimated to cost UK agriculture somewhere in the region of £300 million per year due to production losses; liver condemnations alone cost over £3 million per year².

Liver fluke disease is caused by the trematode parasite, *Fasciola hepatica*. The same species affects both sheep and cattle. Disease is caused as a result of the migration of large numbers of immature flukes burrowing through the liver tissues and/or from the existence of adult flukes sucking blood and causing inflammation in the bile ducts of the liver.

The liver fluke cycle involves two different hosts – the cattle/sheep and the mud snail *Galba truncatula*. Both hosts need to be present to continue the cycle. The snail host is mainly found in muddy, wet areas of ground with poor drainage; hence the prevalence of fluke is greater in livestock grazing such areas.

Winter 2015/16 was high risk for survival of liver fluke which led to high pasture contamination this spring/summer in western regions. Consequently, Autumn 2016 is likely to present a high liver fluke disease risk in these same areas of the UK. In October most UK regions had the usual monthly amount of rain resulting in 'a very high liver fluke disease risk' in western regions of Scotland and north-west England and north Wales, a high risk in eastern Scotland and a moderate/high risk in south Wales and south-west England³.

There is only one active ingredient available that is effective against all stages of liver fluke: triclabendazole. However, historical over-reliance on this flukicide has contributed to resistance development in *F. hepatica*, which has been confirmed repeatedly in the UK³, particularly in sheep-rearing areas⁴. Triclabendazole resistance in fluke causes the biggest disease issues in sheep: sheep are far more susceptible than cattle to the acute syndrome, where most often the initial clinical signs can be multiple sudden deaths (up to 10% of the flock⁵), which can be devastating. Triclabendazole resistance in fluke is a one-way street: no one has been able to report reversal to susceptibility. Therefore, strategies that must be implemented on your farm to decrease the likelihood of triclabendazole resistance developing include:

1. Trying where possible to manage grazing:

- Consider fencing off wetter areas of pasture
- Consider not grazing sheep on high risk pastures during the periods of highest risk

2. Only using flukicides when strictly necessary, taking into account:

- Individual farm history
- Forecasting
- Specific diagnostics

3. When treatment is necessary, making a choice of active ingredient based on season and likely lifecycle stage of fluke infecting your sheep, ie. preserving triclabendazole for times of the year when acute liver fluke disease is most likely.

4. Dosing properly. Weighing individual animals is the gold standard for good dosing practice; if this is not possible animals should be grouped according to estimated size, and dosed according to the heaviest animal in the group:

- Underdosing may increase the risk of fluke surviving
- Overdosing may increase the likelihood of adverse events

5. In conjunction with your veterinary surgeon or animal health advisor, implementing a robust quarantine strategy specifically aiming to reduce the risk of introducing fluke, and even worse, triclabendazole resistant fluke to your farm.

Treatment of liver fluke is not straightforward: different active ingredients are effective against different stages of fluke, and therefore choice of product should take into consideration the time of year, and therefore which stages of fluke you are trying to target. For example, when sheep are most likely at risk of acute fluke disease, caused by ingestion of a huge number of immature stages in late summer, and their subsequent migration through liver tissues, a product targeting younger fluke should be considered. Later in the year, active ingredients which target older fluke should be used. It should always be borne in mind that no flukicide offers a persistency of action, and therefore in high risk areas, treatments will need to be rotated and repeated throughout the year.

Norbrook is expanding its sheep flukicide range to promote sustainable control of liver fluke all year round. The latest addition to Norbrook's sheep flukicide portfolio is Solantel, a new oral drench for the treatment and prevention of chronic and subacute fasciolosis in sheep and lambs.

Solantel is an early-acting flukicide offering treatment against liver fluke from 5 weeks of age. Solantel contains closantel, an anthelmintic belonging to the salicylanilides group. The molecule does not require metabolism by the liver to become active (unlike triclabendazole which is rendered less useful in the face of liver damage): it is absorbed unchanged into the bloodstream, and has limited distribution into other tissues, which means that it specifically targets those parasites which feed on blood, namely liver fluke and several stages of *Haemonchus contortus*. It is also eliminated relatively slowly from the sheep's bloodstream.

Norbrooks sheep flukicide range

Late summer/autumn- Acute liver fluke disease

Triclafas drench for sheep

- Contains triclabendazole
- Kills all stages of fluke above 2 days old
- Dose rate of 1ml per 5 kg bodyweight
- 56 day meat withhold for sheep

Winter/ spring – Subacute liver fluke disease

Solantel drench for sheep

- Contains closantel - early acting flukicide
- Treatment of mature and immature flukes – kills fluke from 5 weeks to adult
- Effective treatment against inhibited, L4 and adult stages of the "barber's pole" worm and the sheep nasal bot fly.
- Dose rate of 1ml per 5kg bodyweight
- 42 day meat withhold

Closamectin Solution for Injection for Cattle and Sheep

- Contains ivermectin - internal and external parasite control
- Contains closantel - early acting flukicide

- Treatment of mature and late immature flukes- kills fluke from 7 weeks to adult
- Fluke, worm and external parasite control in one injection.
- Dose rate of 1ml per 25kg bodyweight.
- Meat withhold period of 28 days for sheep and 49 days for cattle

Spring/ summer – Chronic liver fluke disease

Levafas Diamond drench for cattle and sheep

- Contains levamisole and oxclozanide
- For the control of gutworm, lungworm and liver fluke infections in cattle and sheep
- Treatment of mature liver fluke
- 5 day meat withhold for sheep and cattle

1 AHDB Beef & Lamb. [ONLINE] <http://beefandlamb.ahdb.org.uk/returns/> Accessed: 03/09/2016

2 A. F Loyacano, J. C Williams, J. Gurie, A. A DeRosa (2002). Effect of gastrointestinal nematode and liver fluke infections on weight gain and reproductive performance of beef heifers. *Veterinary Parasitology*. 107(3): 227–234.

3 NADIS. (2016). [ONLINE] www.nadis.org.uk. Accessed: 13/11/2016

4 R. E. B. Hanna, C. McMahon, S. Ellison, H. W. Edgar, P. E. Kajugu, A. Gordon, D. Irwin, J. P. Barley, F. E. Malone, G. P. Brennan, I. Fairweather (2015). *Fasciola hepatica*: A comparative survey of adult fluke resistance to triclabendazole, nitroxylin and closantel on selected upland and lowland sheep farms in Northern Ireland using faecal egg counting, coproantigen ELISA testing and fluke histology. *Veterinary Parasitology*. 207(1-2): 34-43.

5 D. J. L. Williams, A. Howell, J. Graham-Brown, J. Kamaludeen, D. Smith (2014). Liver fluke – an overview for practitioners. *Proceedings of BCVA Congress*.