

Lochaber Monitor Farm Theme Report

What is the liver fluke and resistance threat in Argyll & Lochaber and what can farmers do about it?

The Challenge

A large proportion of the Lochaber sheep flock are given a routine fluke dose 3 – 4 times per year. It is often carried out as a precaution in October when ewes are gathered and returned to grazing on the hill and again in late January/February when ewes are gathered sometimes for scanning or to receive treatment for worms. Spring and summer flukicide treatment is also routine on many farms. Some farmers use different flukicide products, while others will use repeated doses of a 'trusted' product.

However, there have been more and more cases of liver fluke becoming resistant to triclabendazole (The active ingredient in some winter flukicide products). The threat of resistance to familiar flukicide products comes at a particularly bad time, as climate change continues to contribute to warmer temperatures and increased rain fall in autumn and winter, which can see the liver fluke burden in cattle and sheep extended throughout the year.

Members of the community group were challenged with the task of taking October faecal samples from sheep, with the aim of using the results to estimate if liver fluke treatment was necessary and if there was any evidence of flukicide resistance.

This was the first time many of the farmers had carried out this type of testing.



The objective of the trial was to challenge the idea of routine liver fluke treatment at fixed times in the season and decide if dung testing alongside the NADIS forecasting would allow us to make better decisions on farm, reduce product use and reduce instances of triclabendazole resistance, which is irreversible.

Adult Liver Fluke (Source: Moredun Research Institute)

<https://www.moredun.org.uk/research/diseases/liver-fluke>

What we did on farm

- During October 2018, 5 members of the MF community group volunteered to collect 10 dung samples from 10 individual sheep (It is recommended that 10 dung samples for each farm will give a good representation of the flock).
- The samples were dropped into the local Crown vets in Fort William, where they were processed and sent to the SRUC lab.
- Four of the farms took samples from the 2018 crop of lambs as this gives the best representation of this season's fluke challenge, while the fifth farm took samples from ewes, to see if the flock (previously dosed using a triclabendazole product) were resistant to the flukicide.
- Once received by the lab, the samples were subject to individual coproantigen testing (10 for each farm) and a pooled faecal egg test (which uses a small amount of each of the 10 samples to give a pooled result for each farm).
- Results were processed by the lab after approximately 48 hours and returned to Mairi Thom from Crown Vets.
- The selected farms give a good representation of Argyll & Lochaber in October, when liver fluke threat is normally high.

A coproantigen test will detect late immature liver fluke and adult fluke before eggs appear in the faeces. However, it will not detect early immature fluke. It is therefore a particularly useful test to use early in the season as results will show positive results before fluke eggs can be detected in the dung

Test	Cost
Coproantigen test (1-9 samples)	£11/sample
Coproantigen test (10+ samples)	£8.60/sample
Pooled Coproantigen test	£20/sample

A liver fluke egg count test will tell you if adult fluke are actually present in the dung (but will not detect late immatures). A positive result will suggest that it is time to use a flukicide. A retest or a coproantigen test 2-3 weeks later can show if treatment has been successful or if fluke are resistant

Test	Cost
Fluke egg count (1-3 samples)	£12.35/sample
Fluke egg count (4+ samples)	£9.40/sample
Pooled fluke egg count	£24.70

The table below shows the individual coproantigen results for each farm along with the pooled egg count for each farm.

Results

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5
Test Date	23/10/2018	23/10/2018	18/10/2018	23/10/2018	15/10/2018
Lamb 1 (coproantigen)	-ve	-ve	-ve	-ve	+ve
Lamb 2 (coproantigen)	-ve	-ve	-ve	+ve	+ve
Lamb 3 (coproantigen)	-ve	-ve	-ve	+ve	+ve
Lamb 4 (coproantigen)	-ve	-ve	+ve	+ve	+ve
Lamb 5 (coproantigen)	-ve	-ve	+ve	-ve	+ve
Lamb 6 (coproantigen)	-ve	-ve	-ve	-ve	+ve
Lamb 7 (coproantigen)	-ve	-ve	-ve	-ve	+ve
Lamb 8 (coproantigen)	-ve	-ve	-ve	-ve	+ve
Lamb 9 (coproantigen)	-ve	-ve	-ve	-ve	+ve
Lamb 10 (coproantigen)	-ve	-ve	-ve	-ve	-ve
Pooled Fluke Egg Count	-ve	-ve	-ve	+ve	+ve

- The results show, that for farms 1 & 2 all lambs tested negative. There is not a single animal displaying signs of the parasite. Although the results show that dosing is unnecessary, some caution is needed in certain circumstances especially after a wet summer, as you could have negative results and dead sheep 2 weeks later as neither test picks up the early immature flukes.
- On farms 3 and 4, positive coproantigen results are flagged 6 - 9 weeks post infection. This is 2 – 3 weeks before fluke eggs can be detected in the faeces (egg count for farm 3 is negative). Although only 20% - 30% of animals are infected, a flukicide should still be considered as an option for breaking the life cycle. A product containing triclabendazole would kill the immature fluke which is present. It should also be noted that neither the coproantigen or fluke egg tests will detect the early immature fluke, which might also be present.
- Farm 5 shows an example of triclabendazole resistance. The above test was conducted 2 weeks after treatment with a triclabendazole product and shows that treatment has been unsuccessful. Resistance is irreversible, so an alternative strategy will need to be adapted to control the parasite. A vet, or animal health advisor, should be consulted for further advice on liver fluke management.

Potential for cost savings & more informed decision making

The tables below show the total cost of the faecal testing on a farm of 500 ewes. The total cost was £86 for the coproantigen test and £24.70 for the pooled adult fluke egg count.

Faecal testing	Cost	Fluke Dose	Cost
Coproantigen test (10)	£86	Fluke treatment for treating 500 60Kg ewes at £150/5litres At rate of 12ml/ewe	£180
Pooled egg test	£24.70	6 hours labour/handling @ £9/hour = £54	£54
Time spent gathering samples: 2 hours at £9/hour	£18		
Total	£128.7	Total	£234

In this example the potential cost of a wasted or mis-timed dose is therefore £124.

Additional benefits to testing

- Reduced chance of triclabendazole resistance in flock, from unnecessary or miss timed dosing
- Less handling stress on animal.
- Better knowledge of rest of season liver fluke threat and the types of products suitable for treatment.
- Use over time, will allow farmers to identify high and low risk areas of the farm.

Conclusions

This has been a very interesting study, using real farms across Argyll and Lochaber. The following conclusions can be made.

- Liver fluke threat will be highest following a mild winter and a warm wet summer. Winter 2018/2019 was a low –risk season, due to the dry spring/summer.
- Coproantigen testing is a useful early season test for detecting immature fluke not yet present in the dung. When carried out on this season's lambs, can provide a good analysis of this seasons fluke threat.
- Faecal egg testing will detect the presence of adult fluke. It can be used before and after a fluke dose to determine first if adult fluke are present, and second whether or not a dose has been effective (coproantigen can also be used for this).

- Resistance to triclabendazole has been seen on many farms on the west coast. It is essential that this ingredient is only used when necessary. Although products containing triclabendazole kill all stages of liver fluke, which occur in autumn/early winter, using in situations where the fluke burden is low, or at other times in the year when all stages of fluke are not present can increase the chance of resistance developing.
- Other products not containing triclabendazole should be used in late winter and spring, depending on the risk and burden.
- Farmers can use the NADIS fluke forecast, alongside faecal testing as a tool to decide if the regional threat is high. A forecast can be viewed online or sent to you each month by your vet practice <http://www.nadis.org.uk/parasite-forecast/>

Post-trial feedback from participants

Following the trial, participants were asked how useful the trial had been for their businesses.

Farmer 1 & 2 – “Following testing in October, neither the ewe lambs or ewes have received a fluke dose. Sheep are looking healthy, with no visible signs of infection” We will carry out a February pooled egg test on ewes, to see if the threat has changed.”

Farmer 3 – “We knew that this was a flukey farm before the trial. We weren’t surprised to see positive coproantigen results, but we were surprised the tests did not show up any adult fluke. This suggests a very late start to the season, so we made the decision to dose a bit later in the season. We know that this is a high risk farm, and would be interested in using testing again to check for triclabendazole resistance, as we use triclabendazole products early season.”

Farmer 4 – “We were shocked to discover that fluke is an issue on our low ground fields as samples 1 – 5 were all from animals grazed on in bye ground, while 6- 10 were from animals grazed on the hill (all negative). Before the trial, we had never considered dosing low ground store/replacement lambs, as we thought the threat was low. This will now be a priority for us and we will definitely be testing again going forward”

Farmer 5 – “We will continue to work with our vet and develop strategies of dealing with our triclabendazole resistance”

In summary – a successful look at the fluke and resistance threat in Argyll & Lochaber. It has shown that farmers do not necessarily need to carry out repeated routine dosing and should use different products at different times of the year. Dung testing and NADIS forecasting are tools which are recommended for use to aid decision making.