



Liver Fluke Diagnostics and Detection

Test	Application /limitations	Additional comments
Post-mortem examination	The definitive was to diagnose liver fluke.	Abattoir data also very useful.
Fluke Egg Detection Individual or composite samples	<p>The standard sedimentation test can lead to false negatives because:</p> <p>Only adult fluke produce eggs. None will be detected if only immature fluke are present.</p> <p>Egg numbers fluctuate on a daily basis.</p> <p>Fluke burden is low and few eggs are being excreted.</p>	<p>Most labs report a positive or negative result according to whether or not they see fluke eggs in the sample.</p> <p>An actual count should be requested if a FECRT is being carried out.</p> <p>Small numbers of eggs may be detected for around 31 weeks after successful treatment.</p>
Coproantigen ELISA (Faeces sample required)	<p>Can detect fluke infection around 2-3 weeks earlier than the fluke egg count (if fluke burdens are low there may be no advantage).</p> <p>No cross reaction with rumen fluke.</p> <p>Only 0.5g of faeces are required.</p> <p>Coproantigen levels can fluctuate from day to day.</p>	<p>A positive result confirms active infection.</p> <p>The coproantigen reduction test is useful for checking flukicide efficacy – see below.</p>
Biochemistry (Blood sample required)	<p>Liver Enzymes: GLDH levels increase from 2-3 weeks after infection. GGT levels increase around 6 -8 weeks after infection.</p> <p>Albumin: Levels are reduced in chronic disease due to the blood feeding activity of adult flukes.</p>	<p>Changes in blood biochemistry can be variable and are not specific for liver fluke. Interpretation can be difficult and results should not be considered in isolation.</p>
Serology (Blood sample required)	<p>Detects antibodies from 2-4 weeks post infection but levels may rise and fall over time.</p> <p>Remains positive for many months following successful treatment.</p> <p>Could be used check whether in-coming animals have been exposed to fluke.</p> <p>Can be useful in lambs in autumn. Can be used as sentinels for infection.</p>	<p>A positive result does not confirm current active infection.</p> <p>A positive result does not indicate that an animal is immune to liver fluke.</p> <p>Colostrum antibodies can persist for around 3 months.</p>
PCR technology	Used in research but not commercially available.	



Detecting Anthelmintic Resistance in Liver Fluke

Fluke Egg Count Reduction Test:

Pre-treatment – Collect 10 individually identified faecal samples.

Treat using best dosing practice.

3 weeks post treatment – Collect individually identified faecal samples from the same 10 animals.

A validated test has also been described using pools of 10 x 5g faeces and counting all eggs present in the 50g sample both pre and post treatment.

The FECRT can only be used when adult liver fluke are present in the liver and eggs must always be counted. At times of year when immature flukes are also likely to be present it is most useful following treatment with triclabendazole or closantel. It has been suggested that following successful treatment egg numbers should fall by at least 90 to 95%.

Coproantigen Reduction Test:

Pre-treatment - Collect 10 individually identified faecal samples.

Treat using best dosing practice.

2 weeks post-treatment – Collect individually identified faecal samples from the same 10 animals.

This test can be used to assess triclabendazole efficacy at times of year when the liver fluke burden is likely to consist of late immature/adult flukes.

If treatment has been successful the mean percentage positivity should ideally fall by at least 90%.

For other flukicides the test can be used when liver fluke burdens are expected to consist of adult flukes. Any reduction in positivity should be interpreted alongside the expected efficacy of the product against adult liver fluke as noted in the data sheet.

Note that there are no WAAVP guidelines for the detection of flukicide resistance.

Tests used/being developed in research:

Histopathology: Microscopic changes to the liver fluke skin, reproductive and digestive tract can be used as a guide to whether the fluke are resistant to either triclabendazole or closantel. The test requires the recovery of live liver flukes 2-3 days after treatment which has both practical and ethical constraints.

Egg Hatch Assay: Under development with varying success.

Molecular markers: Under investigation.