

Why have my livers been condemned?

Making the most of
abattoir feedback





Introduction

With increasing financial constraints on agriculture, particularly in the sheep and beef industry, maximising returns from farm to fork have never been so important. Margins need to be maximised through efficient growth of animals on farm and achieving carcasses which fall within specification, as well as the minimisation of rejection of edible offals, or the 'fifth quarter'.

Booklet contents

The Cost Of Condemnation	4
The Inspection Process	5
Reasons For Liver Condemnation	6
Liver Fluke Infections.....	8
The Big Question	9
Summary	11

The Cost Of Condemnation



Figures released by the Food Standards Agency (FSA) show that 22% of British cattle sent for slaughter at abattoirs in 2014 had their livers condemned as a result of liver fluke.

1 in 5 livers condemned as a result of liver fluke in Britain in 2014



These figures were higher in Scotland and Wales, with appropriately 27% for both nations.



1 in 4 livers condemned in Scotland and Wales in 2014

It is estimated that the annual loss to the meat industry is over £1.77 million; costs to the farmer are estimated at £87 per head of cattle, and £5.56 per head of sheep¹.



The Inspection Process

Cattle and sheep must all be passed as fit for human consumption, and this is achieved through a continuous chain of assessment:

- Inspection of Food Chain Information (FCI)
- Ante-mortem inspection
- Post-mortem inspection

The FSA are responsible for co-ordinating, monitoring and recording all of the above, and it is a legal requirement that they reject whole or part of a carcase, or an individual organ if it is not deemed fit for human consumption.

Unfortunately this can lead to losses for all concerned:

- Reduced returns for the producer if rejection affects carcase weight
- Non-payment if an entire carcase is rejected
- Financial loss for the Food Business Operator (FBO) if carcase weights are decreased
- Costs of disposal for the FBO if offal or carcasses are rejected, which may be passed on to the producer

A Collection and Communication of Inspection Results (CCIR) Conditions Report should be provided to producers by the FSA.

Abattoir feedback doesn't only provide information on fat class and conformation; the CCIR Conditions Report can also provide valuable indicators of health and welfare on farm. This feedback can be used to guide herd or flock health planning, and proactive implementation can reduce losses and increase efficiency for the future.



Reasons For Liver Condemnation

There are several reasons why livers can be condemned. In the majority of cases, the entire liver will be condemned; rarely, defects are trimmed, and some of the liver can go into the food chain.

Changes in the liver can be very localised (i.e. only affect a very small area, e.g. a cyst), or generalised (i.e. affecting the whole liver, e.g. cirrhosis).

In addition, they can be classified as 'acute' (i.e. have occurred very recently), or 'chronic' (i.e. are as a result of longstanding disease, or a disease insult that occurred a long time ago and has now resolved, although there is still tissue damage present).



Multiple abscesses within liver tissue



Cross-section of a pus-filled abscess



Chronically thickened bile ducts filled with pus



An adult liver fluke within the bile duct



Thickened bile ducts and multiple liver fluke

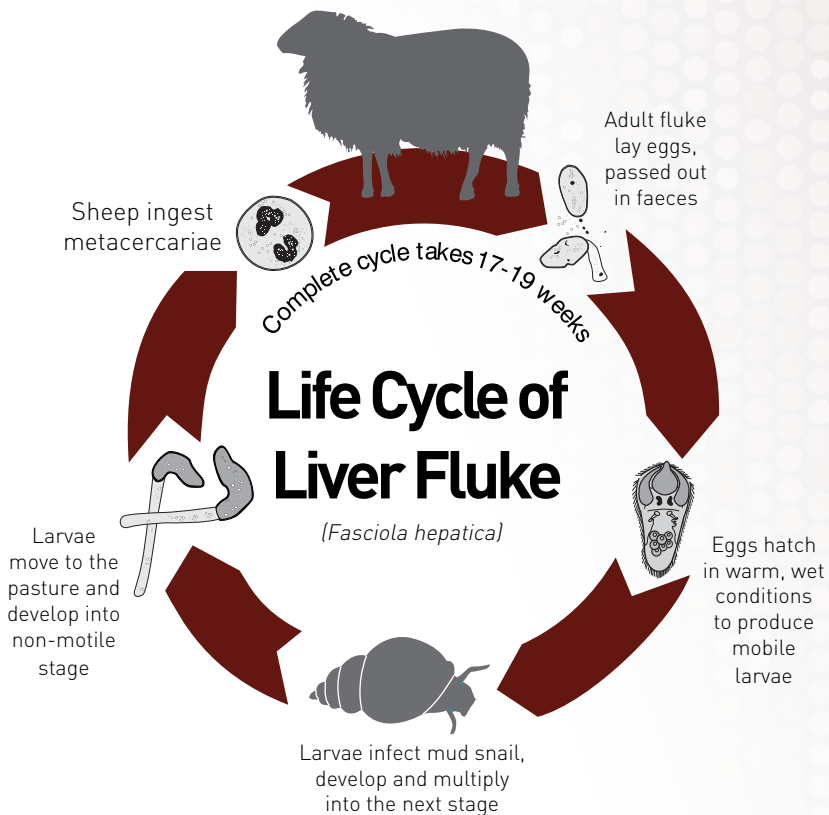
Description	Notes
Abscesses	Often as a consequence of rumen acidosis.
<i>Cysticercus tenuicollis</i>	Cysts in the liver caused by larvae of the dog tapeworm <i>Taenia hydatigena</i> . A particular problem in sheep. Can be confused for fluke damage.
Liver fluke, <i>Fasciola hepatica</i>	Can be: a) Mature fluke seen in the bile duct. b) Damage to the liver caused by immature fluke migrating through the parenchyma (tissue).
Hydatid cysts	Larvae of the dog tapeworm, <i>Echinococcus granulosus</i> form cysts in liver, lungs, brain, heart etc. A problem in sheep.
Historic scarring	Permanent liver scarring and loss of function due to longstanding liver disease. A chronic sign but not specific to initial cause; i.e. can be caused by several primary diseases.

Reasons For Liver Condemnation

As previously stated, damage directly to the liver by liver fluke can be active or historical. Once infected, animals can suffer permanent liver damage, which will result in reduced performance; however, most often this is only evident on examination of the liver at slaughter.

Terms used are as follows:

- 'Fluke adult'
 - Infection will have been present for some time, 10 weeks or more.
- 'Fluke immature':
 - Infection has occurred very recently, in the past ten weeks or less.
- 'Historical scarring'
 - A result of longstanding disease, or a disease insult that occurred a long time ago and has now resolved, although there is still tissue damage or scarring present.
 - Not exclusively caused by liver fluke.



Liver Fluke Infections

As well as liver pathology caused directly by liver fluke, there can also be generalised (whether caused by fluke or otherwise) signs of liver damage throughout the body:

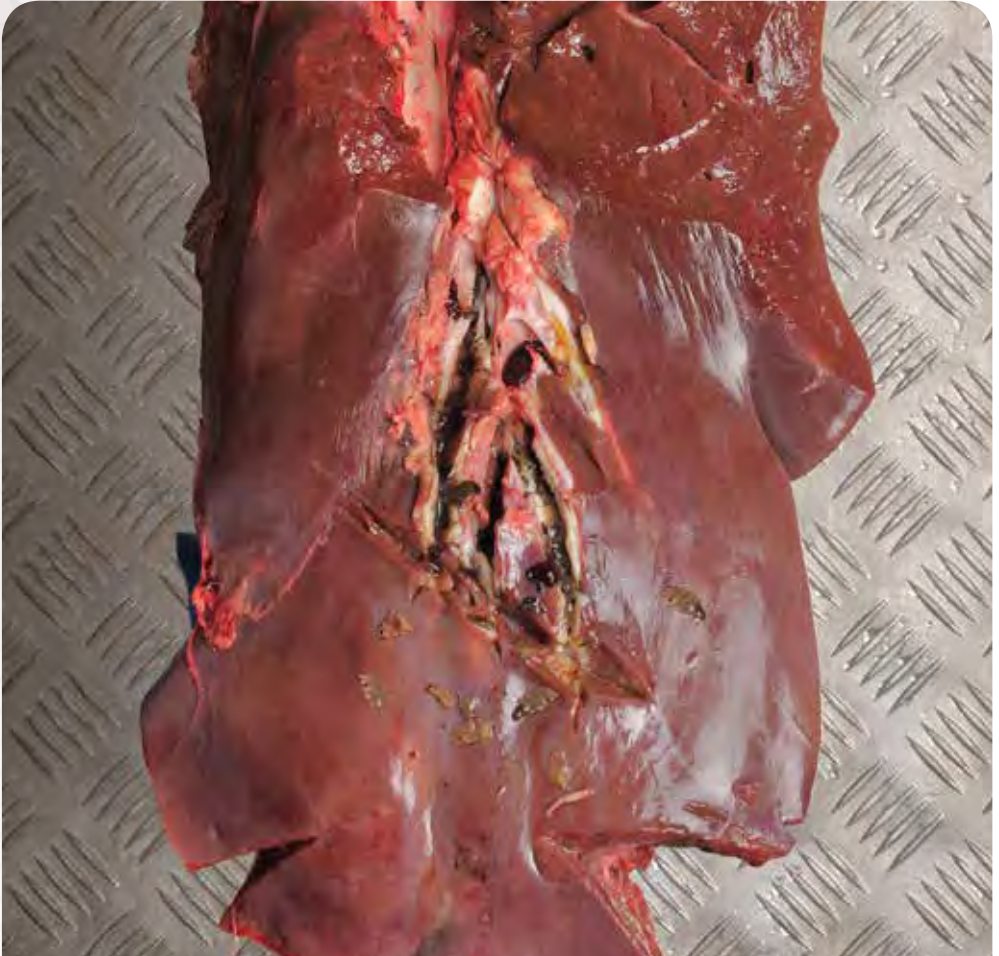
- Jaundice:
Carcass has a yellow tinge
- Oedema:
Excessive collection of fluid in the body tissues

If these signs are also present, unfortunately the entire carcass will be condemned, rather than just the liver.

Confusing?

The more definitive information you can be provided with, the better:

- Are your stock currently infected, or have they suffered infection in the past?
- Are your current fluke control measures (treatment and management factors) sufficient?



The Big Question

I treated my stock for fluke this year; why have I received reports of condemnations from the abattoir?

There could be several reasons for this:

- 1 Choice of active ingredient
- 2 Time between housing and treatment
- 3 Poor dosing practice
- 4 Resistance
- 5 Overwhelming burdens

1. Choice of active ingredient:

Different active ingredients have different spectrums of flukicidal activity with regards to the lifecycle stages of fluke. There is only one active ingredient (triclabendazole) which will kill fluke over two days old in sheep, and two weeks in cattle, however, resistance to this is becoming rapidly widespread in *F. hepatica*. Triclabendazole use therefore must be reserved for very specific circumstances; ask your vet or animal health advisor for more details.

Table 1. Efficacy of different actives against the stages of fluke*

Age of Fluke (in weeks)														
Flukicide	1	2	3	4	5	6	7	8	9	10	11	12	13	14+
Albendazole										50 - 70%		80 - 99%		
Clorsulon								50 - 70%				80 - 99%		
Oxyclozanide										50 - 70%		80 - 99%		
Nitroxynil								50 - 90%				80 - 99%		
Closantel			23 - 73%		91%		91 - 95%					97 - 100%		
Triclabendazole	90 - 99%			90 - 99.9%										

* The efficacy of each active ingredient may differ between products. Please refer to the product SPC for more information.

The Big Question

2. Time between housing and treatment:

For cattle who are housed during the winter, timing of treatment after housing is crucial, particularly if the main aim of treatment is to reduce liver condemnations at slaughter. This is because clearance of fluke will be more effective if all of the fluke within the animal are above an age which the active ingredient is effective against.

3. Poor dosing practice

Poor dosing practice with flukicides can reduce the efficacy of any product, and in rare cases also reduce the safety. Strategies to adopt include:

- Calibrate and maintain dosing equipment.
- Dose according to weight. The gold standard is individual weighing, however, if this isn't possible, group animals. Do not be tempted to underdose due to pack sizes not being convenient.
- Follow the manufacturer's instructions carefully: administer products via the route for which they are licensed, and don't mix products.
- Store products correctly.
- Administer flukicides to every animal in the group. Animals that are missed can act as a source of infection post-treatment. No flukicide has a persistency of action.



The Big Question

4. Resistance

As previously mentioned, reports of resistance in *F. hepatica* to triclabendazole are becoming more widespread, and are causing problems in sheep, who suffer the more acute syndrome of liver fluke, caused by migrating immature fluke. Use of this active ingredient should be reserved for specific circumstances; speak to your vet or animal health advisor for more information on incorporating rotation of alternative active ingredients, such as closantel or oxyclosanide into your health plan at specific times of year, to reduce reliance on triclabendazole and slow the rate of resistance development.

5. Overwhelming burdens

To gain a licence as effective against a specific parasite, any parasiticide has to have proven that when administered, more than 90% of the target parasites are eliminated from the host.

In years when the grazing season has been extended due to milder winters following wet summers, and optimum conditions for fluke development on pasture and within snails have been achieved, cattle may be housed harbouring huge numbers of parasites. This can mean that a proportion (i.e. less than 10%) of a pre-existing large burden of fluke surviving treatment, could be significant enough still to result in condemnations. This does not mean that the treatment has been ineffective; the burden has been reduced by more than 90%, however, it only takes a single fluke or signs of historical damage to have a liver rejected.

Summary

- Abattoir reports can be a useful measure of animal welfare on farms.
- Abattoir reports can be used as one output measure to evaluate the efficiency of farm management of parasites.
- It is important to understand the different causes of liver rejections and their implications for your management practices.
- For more information on how to use your reports to inform your health plan, contact your vet or animal health advisor.

References

1. BRP. 2016. *Minimising carcass losses manual*. AHDB Beef & Lamb. [ONLINE] Available at: <http://beefandlamb.ahdb.org.uk/wp/wp-content/uploads/2016/03/BRP-Minimising-carcass-losses-manual-9-240316.pdf>. [Accessed 15 August 2016].



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