

Diagnosing and controlling development of sheep scab

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Sheep scab, caused by the mite *Psoroptes ovis*, is endemic and not a new problem to the UK sheep industry.



Figure 1. Examining scab material and skin scrapes under the microscope to look for mites is one method of diagnosis.

Previously notifiable, the UK was free from the disease for around 20 years until the early 1970s, when it was reintroduced with imported sheep. Reports of the disease were very few by the late 1980s.

From 1973, scab was notifiable and plunge dipping was compulsory, but deregulated in 1992. The Sheep Scab Order 1997 states it is an offence not to treat sheep and contact animals showing visible signs of the disease, or to move them unless to aid treatment or transport to slaughter.

Several issues make this disease difficult to control, such as reaching a correct diagnosis, incubation prior to clinical signs, survival of mites off the sheep for up to 17 days, limited treatment

options and compliance.

Clinical signs

The main risk period is between October and March, as the disease is at its most prevalent. Sheep scab, as the name suggests, causes skin lesions due to an allergic reaction to mite faeces. Initially, when mite numbers are low, lesions may not be visible and sheep only appear slightly restless and may be rubbing against fence posts due to discomfort.

As the disease progresses, larger areas of wool loss are seen, with pustules and inflamed skin, and the skin becomes broken and raw as sheep scratch and rub these areas. If left untreated, sheep lose condition, may show neurological signs and the disease can be fatal.

From initial contact, it can take 60 days to 240 days for lesions to appear and animals can become reservoirs of infection following treatment, with small numbers of mites surviving in areas such as the inguinal fossa. In ideal conditions, the mite can complete its life cycle in as little as 14 days, with females surviving up to 40 days. With this delay in the development of clinical signs, it is easy to see why keeping it out of flocks buying in sheep can be difficult.

Diagnosis

One difficulty vets face is convincing farmers it is worth investing in veterinary intervention immediately to have the best chance of reaching an accurate and quick diagnosis; therefore, starting the correct treatment course as soon as possible. The clinical signs described cannot be distinguished from lice, yet assumptions are often made about the cause of the problem.

Correct diagnosis is essential to avoid:

- wasted expense on the wrong treatment
- further compromises to animal welfare due to delayed diagnosis
- further disease spread
- further production losses
- further development of anthelmintic resistance by not using macrocyclic lactones unnecessarily when lice is the issue requiring treatment

Unfortunately, another issue is, even after presentation of the sheep, diagnosis is still difficult. Examining scab material and skin scrapes under the microscope to look for mites is one method of diagnosis. Wool plucks containing scab material and skin scrapes should be taken from the edge of the lesions where mites are most likely to be feeding.



Figure 2. Sheep showing signs of sheep scab. Image: © Phil Scott/NADIS.

Initially, look at the wool plucks and, if no mites are seen, add a drop of 10 per cent potassium hydroxide (KOH) solution to the skin scrapes on a slide and warm gently, examining after 15 minutes. Alternatively, mix the KOH solution and skin scrapes, leave for 10 minutes and centrifuge before examining the sediment. Wool plucks and skin scrapes can also be sent to commercial laboratories.

Skin scrapes aren't always going to be successful in picking up infection. If mites aren't seen, it may also be because low numbers are present or the animals have already received treatment.

An ELISA test has been developed that offers some advantages over traditional methods of diagnosis. Sheep seroconvert two weeks to four weeks following infection; therefore, the ELISA could allow a diagnosis before clinical signs are seen, or prior to leaving quarantine for bought in animals.

Response to treatment can be shown using paired serology, which will show a declining titre as animals recover. This could also be a useful tool for flocks or areas to show freedom from infection – it is thought sampling 12 animals from each management group should provide an accurate indication of disease status.

Treatment

Only two treatment options for sheep scab exist and both pose issues.

Plunge dipping in products containing diazinon will kill the scab mites, as well as protect against other ectoparasites. Operators must hold a certificate of competence in the safe use of sheep dips or be working under the supervision of someone who does, as well as wear adequate protective

equipment, work in ventilated areas and dispose of used dip wash appropriately. Dips must also be replenished regularly to avoid use of a diluted solution, which may not be effective. Synthetic pyrethroid dips were withdrawn by the VMD in 2006 due to their harmful effects on the environment.

The alternative is injectable macrocyclic lactones – doramectin, moxidectin or ivermectin (note moxidectin one per cent cannot be used in animals previously vaccinated against foot rot).

Their use, while potentially more convenient than plunge dips as no specialist licence or equipment is needed, is not without problems, as they are not selective and also effective against intestinal worms. Therefore, their use when scab is the only intended target also results in exposure of gut worms to these drugs.

Anthelmintic resistance is a major problem in the UK sheep industry and non-targeted use of anthelmintics can speed up the development of resistance.

As these products are classified as POM-VPS treatments, monitoring their use can be difficult and it is essential to discuss their use at health planning meetings with clients.

To ensure sheep scab treatment will be successful, while keeping the risk of development of anthelmintic resistance to a minimum, ensure the following when prescribing these treatments:

- Animals are weighed and dosed to the heaviest in the group.
- Guns are calibrated correctly and checked regularly.
- Method of administration is consistent and successful.
- All in-contact animals are treated – this contradicts the advice for worming sheep where some should be left untreated.
- For non-persistent products, ensure sheep are moved the same day so they are not returned to pasture where mites will be surviving off the host for up to 17 days.

Biosecurity



Figure 3. Sheep showing signs of sheep scab. Image: © Phil Scott/NADIS.

Buying in animals is a risk factor for bringing scab into a flock, as well as other parasites and diseases.

Buying privately, rather than through a market, will help minimise contact with unknown sheep.

However, as discussed, knowing if sheep are already carrying mites is impossible, so treatment should always be given as part of the quarantine protocol, which includes:

- keeping bought-in sheep separate from the main flock for at least 21 days
- treating with group four or five anthelmintics to reduce the risk of introducing resistant worms
- treating for fluke, if bought from an affected area
- treating for scab via:
 - – plunge dipping
 - – one-dose moxidectin
 - – two doses of ivermectin, if meat withdrawal could be an issue in the case of store lambs
 - – use of ELISA, to ensure freedom from disease before treatment or introduction to the main flock

Summary

Despite being a well-known disease, diagnosis and treatment of sheep scab can be problematic. The more we can engage clients with the importance of early intervention, the more we will help them to control the spread of disease and deliver successful early treatments.

As the presence of this disease can have serious effects on the health and welfare of animals, as

well as the profitability of the farm, the more advice we can provide, the better it will be for all involved.

References

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