The Sheep Farmer’s Guide to:

FOOTROT
and its control
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Footrot is undoubtedly one of the most important health and welfare issues facing the UK sheep farmer. Poorly controlled, the disease causes visible pain, reduces performance and costs the sheep industry millions of pounds in terms of labour, treatments and premature culling.

Lameness control programmes often fail on sheep farms, either because an accurate diagnosis of the cause has not been achieved, or because re-infection has occurred and risk factors have not been successfully minimised. Measures such as foot bathing, foot trimming and use of antibiotics can all help, but often fail to break the cycle of re-infection. A successful control programme must incorporate a clear understanding of this infectious disease, the factors that predispose sheep to infection and involvement of all the sheep on your farm.

Accurate diagnosis of the cause of lameness is a crucial starting point. For example, in recent years a new, very severe form of lameness - Contagious Ovine Digital Dermatitis (CODD) - has emerged. Unfortunately, CODD does not respond to traditional footrot treatments and vaccination is also ineffective.

Footrot, however, remains the most common cause of lameness, and a well-planned, whole flock footrot control programme incorporating vaccination will pay dividends. Not only will it reduce the incidence of lameness and the associated losses, it will also cut the time, effort and costs associated with foot care. This guide will help you to formulate a practical, cost effective plan to control footrot in your flock.

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The first step in any attempt to control or treat lameness in a flock is to establish the cause of any disease. Only then can an effective control programme be implemented. Although footrot is a very common cause of lameness in sheep, it is easy to confuse the different lameness conditions. If in any doubt, ask your vet to help by examining a sample of affected sheep.

**Correct diagnosis of lameness is essential**

Distinguishing between footrot, scald and contagious ovine digital dermatitis (C Dodd)

**Footrot** often starts between the toes at the heels and then tracks forwards and outwards, leading to under-running of the hoof and a typical smell. A whole flock disease management programme will control footrot and vaccination with Footvax is a key part of many successful control strategies.

**Scald** is found predominantly in young lambs between 1 and 3 months old. Classic signs are reddening and loss of hair between the toes. Scald can be controlled with footbathing or antibiotic sprays. Treat susceptible flocks around 3 weeks before the condition normally appears.

**C Dodd** is a disease of the coronary band (where the hoof meets the skin). It is relatively new to the UK and its prevalence is unclear.

C Dodd starts in the coronary band, but quickly under-runs the wall of the hoof. It involves the outside wall of the hoof (rather than the sole as is the case with footrot), tends to bleed easily and lacks the smell typical of footrot.

A veterinary diagnosis is essential for the correct treatment of C Dodd. Neither traditional footbaths or vaccination against footrot will control the condition. Treatment with antibiotic footbaths or injections can help, but results can be variable. Consequently, the objective should be to work with your vet to keep C Dodd out of your flock.
What causes footrot?

There are 2 separate bacteria involved: *Fusobacterium necrophorum* first infects the hoof space, allowing the second bacteria, *Dichelobacter nodosus*, to enter deeper into the foot and cause major infection. *F. necrophorum*, which also causes scald, is commonly found in the gut and faeces of sheep. *D. nodosus* is carried by infected sheep and can remain infectious for only 7 to 10 days off the sheep. This means that feet of infected sheep are the main source of infection.

How and when does footrot spread?

Footrot is highly infectious! It is easily passed from sheep to sheep via pasture, bedding etc, particularly when they are confined in a small space e.g. during housing periods or in handling yards. It can occur at any time, but is most common in the spring and autumn when warm and wet conditions prevail. Temperatures above 10°C allow *D. nodosus* to survive on pasture or bedding long enough to spread from sheep to sheep. Control measures including vaccination should be completed in advance of the peak risk periods. Footrot is less likely to occur and spread in cold winters and dry summers when sheep are outside.
What are the consequences of footrot?

Losses due to footrot can vary from flock to flock, but a trial conducted in 2009 & 2010 has shown that the treatment and labour costs alone for a case of footrot are as much as £8.38 per ewe!!

This doesn’t take into account the in-direct costs:

- **Lost productivity**
  Ewes in poor body condition due to lameness will usually have fewer, smaller lambs than their healthy flock mates, resulting in a lower lambing percentage. For example, a reduction of 10 lambs per 100 ewes (150 vs. 160 lambs sold) at typical costs will result in a margin loss of around £3 per ewe.

- **The time factor**
  The time involved in catching and injecting individual lame sheep and footbathing whole groups soon adds up. It is estimated that every time growing lambs are gathered during the summer their growth suffers by 250g. That’s 1kg of lost production if they are gathered 4 times!
Why vaccinate against footrot?

Footvax is the only vaccine available to treat and prevent footrot. It contains 10 strains of *D. nodosus*, and so offers broad protection from the disease. All flocks facing a footrot challenge should consider vaccination as part of their control programme.

No natural protection

Sheep do not produce a natural antibody response to *D. nodosus*. This means they will never develop a natural immunity to footrot and will remain susceptible year after year. This is why annual booster vaccination timed prior to the main risk period is so important.

Treatment and prevention

Unlike most other vaccines, Footvax can treat infected sheep as well as provide longer term prevention of further problems. Footvax effectively treats footrot because it stimulates the sheep to produce antibodies against *D. nodosus*.

When to begin using Footvax

A programme to control footrot should ideally begin in a dry period in the summer or autumn. Weaning is often a good time.

Many farms that successfully control footrot adopt an approach based on the effective use of Footvax. This approach will reduce the number of infected sheep, and over a number of years, can dramatically reduce the financial consequences of the disease.
Implementing a footrot control on your farm

Examine feet and make an accurate diagnosis

Initially, inspect the feet of every sheep. If in any doubt about identifying footrot, involve your vet or advisor so that an accurate diagnosis of any lameness problem can be made.

Initial treatment and use of Footvax

All sheep in the flock should be vaccinated with Footvax. For lame sheep this acts partly as a treatment, and 2 doses should give 70% recovery. The use of two doses 6 weeks apart is best practice for both treatment and long term future prevention of footrot.

After examination and the first vaccination, it is advisable to divide the flock into two groups: assign the sheep with no footrot lesions to a “clean” group but if footrot lesions are suspected, assign the sheep to an infected group. The groups should be kept separate until satisfied that the lame sheep are fully cured, and the clean group should be kept on pasture clear of sheep for at least 10 days to avoid the risk of re-infection.

For the more severely affected lame animals consider the use of antibiotics as well as vaccination. Antibiotics are only available from your vet who should be consulted on the most effective product for your disease problem. Animals that do not respond to treatment with antibiotics and vaccination should be culled.
Future footrot control

Booster doses of Footvax are required to maintain flock immunity to footrot. Where the flock has historically experienced one period of risk e.g. lameness when housed, a single booster dose 2 to 4 weeks before this period is required. Where multiple risk periods or an all-year-round risk have been identified, a booster dose for all sheep every 6 months is advised. Where practical, sheep should also be routinely foot-bathed whenever they are gathered, and any lame sheep should be caught, inspected and treated accordingly. All replacement ewes and rams should be given 2 doses - 6 weeks apart - to successfully incorporate them into the system, as well as being inspected, foot bathed and quarantined to avoid bringing in new infection.

FLOCK SECURITY

Ensure no new infection is brought into a flock by:

- Examining, vaccinating and footbathing new sheep as soon as they arrive on the farm
- Segregating and treating any infected sheep
- Quarantining new sheep for 3 to 4 weeks
- Inspecting again before mixing
Foot bathing, foot trimming and use of antibiotics on individual infected sheep can all help in the control of lameness, but all have their drawbacks for treatment and control of footrot.

**Foot bathing**
On many farms, a footrot control strategy based on footbathing with formalin or zinc sulphate products alone proves ineffective. Footbathing only applies a topical disinfectant that may not penetrate deep into the infected foot. Even when practiced in association with foot trimming, footbathing will not effectively treat every animal with footrot, and is unlikely to eradicate footrot from a flock. Footbathing is, however, usually very effective when trying to control scald in lambs.

**Foot trimming**
Foot trimming is not in itself a cure for footrot, but can be an aid to diagnosis of the different lameness conditions. It can be used to examine a foot to determine if footrot is present, but must never draw blood. Excessive foot trimming is in itself a common cause of lameness in sheep, and can cause toe granuloma (often called a ‘strawberry’ - see picture below).

Chronic cases of footrot are best treated under veterinary supervision with injectable antibiotics before any attempt is made to trim the foot.

**Antibiotic treatment**
This can be essential for some causes of lameness e.g. CODD, foot abscess and some cases of footrot. However, for flocks with moderate to high levels of footrot, catching and treating individual lame sheep can be very time consuming, and relies on early treatment before the bacteria have had time to spread.
We’ve said goodbye to FOOTROT

We couldn’t believe how well Footvax cleared up the footrot problem.
Hewitson Family, Cumbria

Footvax has increased lambing by 4-5% and delivered more saleable lambs.
Finlay Smith, Lanarkshire

Vaccination with Footvax means footrot is a rarity and we don’t footbath at all.
Jonathan Kendall, Dorset

Since vaccinating with Footvax, lameness amongst ewes has fallen to less than 2%.
Morris Brothers, Shropshire

- Footrot is a very common cause of lameness in sheep
- Traditional footrot controls can fail because it is an infectious, whole flock disease
- Vaccination with Footvax can form an important part of a successful whole flock control programme
Footvax contains 10 strains of inactivated Dichelobacter nodosus. Thiomersal BP 0.15% is added as a preservative.

Uses
For the active immunisation of sheep as an aid to the prevention of footrot and reduction of lesions of footrot caused by serotypes of D. nodosus.

Dosage and administration
Dosage: 1ml
Initial Course: Two doses, 6 weeks apart by subcutaneous injection. The site for injection is on the side of the neck 2-3 inches behind the ear. Thoroughly shake the vaccine before use.
Vaccination programmes: These should be tailored to meet individual flock requirements which will vary from season to season according to the actual or likely incidence of footrot. Wherever possible ‘whole flock’ vaccination programmes should be adopted. By this means disease incidence in the flock will decline and subsequent disease risk from the environment will be greatly reduced.

Contra-indications, warnings, etc.
Can be used during pregnancy.
Do not vaccinate sheep within 6-8 weeks of shearing. Do not use in lactating dairy sheep.
Do not vaccinate ewes in the period of 4 weeks before lambing to 4 weeks after lambing. Sheep destined for show or sale should not be vaccinated within the previous 6 months because of the occurrence of a well defined, inactive lump at the site of injection.
Syringes and needles should be sterilised before use and the injection made through an area of clean, dry skin, taking strict precautions against contamination in order to reduce the possibility of abscess formation.

Operator warnings
This product contains mineral oil. Accidental injection/self injection may result in severe pain and swelling, particularly if injected into a joint or finger, and in rare cases could result in the loss of the affected finger if prompt medical attention is not given.
If you are accidentally injected with this product, seek prompt medical advice even if only a very small amount is injected and take the package leaflet with you. If pain persists for more than 12 hours after medical examination, seek medical advice again.

Adverse reactions
The vaccine may cause a reaction at the site of injection. This may range from a slight swelling from about 24 hours after injection, to a well-defined lump of about 3 cm diameter 8 days after injection.

These may further increase in size to 5 or even 8 cm diameter but these swellings generally remain inactive and may resolve completely within 4-6 weeks. Frequently swellings persist for at least ten weeks. Occasionally, however, these swellings may be large, painful and unsightly, with the formation of abscesses which may burst and discharge, particularly if any contaminating skin bacteria are introduced at the time of injection. Even so, partial or complete resolution within ten weeks of inoculation can be expected. Reactions to second doses develop more slowly but the formation of necrotic lesions is rare. Occasionally abscesses may be noted on macroscopic examination of injection sites. Subcutaneous necrosis and inflammation may be noted on microscopic examination of injection sites.

On rare occasions variable incidence of generalised lameness has been reported in vaccinated sheep. This is thought to be due to a local immunological reaction in the feet and is transitory in nature, occurring within 24 hours of vaccination and normally persisting for no more than 48 hours. Treatment is seldom necessary.
Occasional hypersensitivity reactions may occur. In such cases an appropriate dose of adrenalin and/or antihistamines should be administered without delay.
When the vaccine is given at twice the recommended dose a reaction similar to that described above should be expected. In some cases skin lesions with overt pus accumulation or slight necrosis develop. This necrotic skin lesion and pus accumulation occurs less frequently following a second injection. There are no adverse clinical signs in animals following treatment with 2x dose. There is no specific antidote.

Legal category
POM-VPS

Reference
2. FAI Trial 2009-2010

With thanks to Mr C Lewis BVetMed, DipECSRHM, DSHP MRCVS who supplied many of the photographs in this guide.