

A TECHNICAL GUIDE TO FOOTROT AND IT'S CONTROL



**MADE FOR NEW ZEALAND,
IN NEW ZEALAND**

MSD
Animal Health

Introduction

Footrot is a common cause of lameness in sheep and is an important health and welfare issue that affects sheep of all ages. A contagious disease caused by bacteria, footrot causes visible pain, and can cause economic losses from reduced growth rates, decreased wool production, reduced fertility in ewes and rams, as well as increased costs of treatment, labour and premature culling.

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.



Correct diagnosis of lameness is essential

Lameness control programmes often fail on sheep farms, either because of an inaccurate diagnosis of the cause, or because re-infection has occurred and risk factors have not been successfully minimised. The first step in an 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 some of your affected sheep.

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.

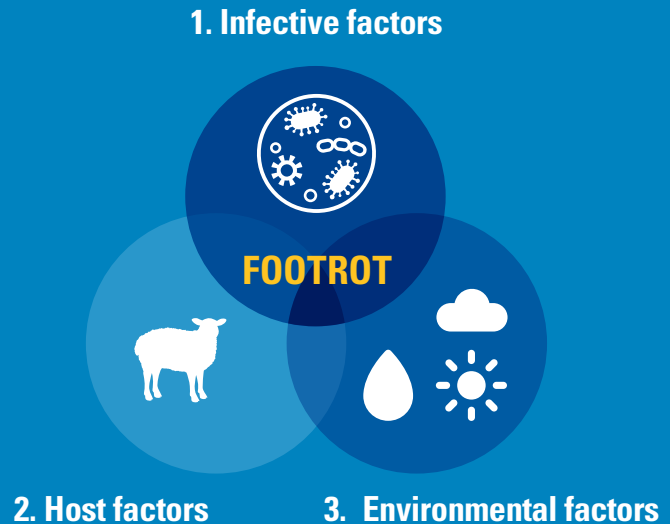
Scald is found often in young lambs between 1 and 3 months old, but also sheep of any age. Classic signs are reddening and loss of hair between the toes. Scald can be controlled with footbathing or antibiotic sprays. Treat susceptible flocks around 3 weeks before the condition normally appears. Not all scald becomes footrot, however it is usually a prerequisite of footrot for scald to occur.

Key facts about footrot

What causes footrot?

Footrot occurs due to a combination of:

1. **Infective factors involving bacteria** – when moisture and temperature conditions are favourable, the disease starts as inflammation between the claws. If the right bacteria are present it will develop through stages to severe under-running of the hoof
2. **Host factors** – the immune status of the sheep and genetic selection for footrot resistance
3. **Environmental factors** that create an ideal environment for transmission of the disease (eg. warmth, moisture)



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 particularly when they are confined in a small space e.g. during handling in 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 long enough to spread from sheep to sheep. Control measures including vaccination should be completed in advance of the peak risk periods.

What are the consequences of footrot?

Losses due to footrot will vary from flock to flock, but could be as much as \$17 per ewe in the flock each year, or up to \$170 per infected ewe (based on UK data¹.)

INFECTED FARMS INCUR COSTS FROM:

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 could result in a margin loss of around \$5 per ewe.

Treatment and culling costs

Treatment of footrot using antibiotics and foot bathing, plus the labour, can easily add up to \$7- \$8 per ewe. Additionally, the effect of an increased replacement rate – due to culling of chronically infected sheep – and the extra feeding for thin and lame ewes could be an additional \$11 per ewe.

The time factor

The time involved in catching and injecting individual lame sheep and footbathing whole groups soon adds up.

1. Wright *et al* (2014) Sheep health, welfare and production planning using financial indicators In Practice 36: 191-198.

Why vaccinate against footrot?

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.

Vaccination is an integral part of the **Five Point Plan** for lameness reduction. The Five Point Plan incorporates both preventative and therapeutic approaches to managing sheep lameness.

The Five Point Plan can be split into three objectives:

- **Vaccinate** to establish immunity
- **Cull** to build flock resilience
- **Treat, quarantine** and **avoid** to reduce the disease challenge



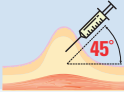

This is a long-term management programme designed to reduce lameness in your flock.



Footvax® is the only proven 10 strain footrot vaccine available in New Zealand to treat and prevent footrot. It contains 10 strains of *D. nodosus*, and so offers broad spectrum protection from the disease. Footvax provides up to 16 weeks protection in coarse woolled breeds and 12 weeks in fine woolled breeds, hence correct timing is essential.

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*.

All flocks facing a footrot challenge should consider vaccination as part of their control programme.

Dose:	1mL	
Primary Vaccination Programme:	2 shots	
Administer by: SC (Subcutaneous)		
Annual Booster:	Required	

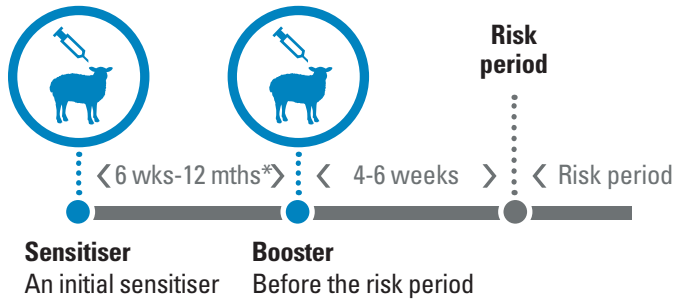
When to begin using Footvax

Your Footvax vaccination programme should be designed for your farm in consultation with your veterinarian and used in conjunction with footbathing, foot trimming, culling and antibiotic treatment.

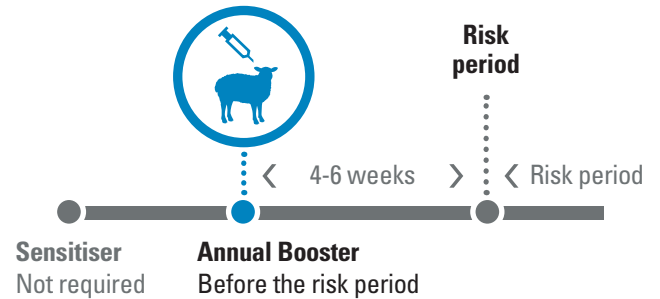
A programme to control footrot should ideally begin in a dry period in the summer or autumn, but can be commenced at any time (note label recommendations as to times when vaccination with Footvax is not recommended, e.g. within 4 weeks of mating or lambing and concurrently with other vaccinations). Weaning is often a good time.



PRIMARY VACCINATION PROGRAMME



SUBSEQUENT YEARS



*Due to being an oil-based vaccine, Footvax allows flexibility with respect to primary vaccination interval, however extra care needs to be taken to avoid accidental self-injection

Many farms that successfully control footrot adopt an integrated approach which includes the use of Footvax in conjunction with footbathing, foot trimming, culling and antibiotic treatment. 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 programme

Examine feet and make an accurate diagnosis.

Initially, inspect the feet of every sheep. If in any doubt about identifying footrot, an accurate vet diagnosis of any lameness problem should 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 can give an improvement of symptoms in up to 70% of cases. 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 infected 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.

A tetracycline antibiotic is usually the first choice antibiotic for Footrot. Engemycin® is a very effective option at a prolonged-action dose rate (10mL/50kg). It is also a green traffic light antibiotic, rather than the other products commonly used which are red traffic light.

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 in early spring, 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 yarded, 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 (often requiring paring feet), foot bathed and quarantined to avoid bringing in new infection.

Flock biosecurity

Ensure no new infection is brought into a flock by:

- Examining, vaccinating and foot bathing 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.

Other lameness control methods

Culling

Often severe, non-responsive to treatment cases should be culled. It should be noted that to send to slaughter facilities, sheep need to be able to bear weight on all 4 legs, so severe cases may not be suitable for transport.

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



Foot trimming



Granuloma 'Strawberry'

Foot bathing

On many farms, a footrot control strategy based on footbathing with formalin or zinc sulphate products alone proves ineffective. Formalin use should be discouraged as it is effectively preserving the foot and is toxic to users also. Without paring, footbathing 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.

However, footbathing is usually very effective when trying to control scald.

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 should not 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 on previous page*).

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, including severe 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. This is also costly.

Farm strain-specific vaccines

It is possible to diagnose which specific serotypes of *D.nodosus* are present on a farm. A monovalent/bivalent vaccine can then be created for your farm. This has advantages and disadvantages, and should be discussed with your vet, as this can be an expensive option with questionable benefit over the use of multivalent vaccines such as Footvax.

