



Putting ewe's best foot forward

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The importance of tackling lameness

Lameness in sheep is a serious problem that needs to be tackled head-on. A Farmers Weekly survey involving sheep farmers and vets revealed that between 5% and a staggering 20% of recipients' sheep were lame at any one time. This is a cause for concern and clearly a very real health and welfare issue. As shepherds we have a 'duty of care' to ensure that our sheep are not suffering. And let's not forget lameness also has significant economic implications.

In 2011, FAWC published their *Opinion on Lameness in Sheep*, which called upon the government to enforce the law dealing with the welfare of sheep. The report recommended that:

- The prevalence of lameness should be reduced to 5% or less by March 2016 and to 2% or less by March 2021.
- The government should enforce the law dealing with the welfare of sheep using various penalties.
- The government should work with the industry to develop a national strategy to reduce lameness in sheep.





With welfare becoming more visible on government agendas, it is important that the sheep farmer addresses this ongoing problem. Fields full of lame animals do nothing to enhance our public image. So, a practical protocol and proactive approach is needed to tackle the problems of lameness in sheep so that targets set by FAWC are fulfilled and that costly penalties are not imposed. See end of this note for sources of more information.

The true cost of lameness



A lame sheep is not only in pain, she's not performing and she's costing money. Lameness affects an animal's ability to eat, which in turn affects production and the animal's immune system. A lame sheep spends less time grazing and is less able to compete for food so there is reduced weight gain in youngstock, loss of condition in adult sheep and more risk of metabolic problems in pregnant ewes. A very lame ram will have a reduced sperm count so will be less fertile and being less mobile, will cover fewer ewes.

As a lame ewe is in less than optimal condition, her conception rate may be lower because she is producing less eggs; and she will spend more time lying down and feel less likely to seek the ram when she is in season. She may also be unable to stand the weight of the ram mounting her so won't conceive at all. If she is already pregnant and doesn't feed adequately, she risks losing her lambs as the embryos won't implant in the uterine wall. At best she will produce underweight lambs with a decreased survival rate. The quality of her colostrum will also suffer as will her ability to nurse her lambs adequately so they will suffer reduced growth rates too.

Lameness expert Laura Green, of Warwick University, estimates it could be costing as much as £10-15 for every ewe put to the tup with 8% lameness in the flock, that's up to £15,000 for a 1,000-ewe flock. And the annual treatment and labour involved in dealing with foot problems alone could be costing the producer more than £10 a ewe (FAI Farm Research). So, caring for sheep's feet must be a priority.

The healthy foot – knowing what's 'normal'

Knowing what a healthy foot looks like makes it easier to recognise abnormalities and disease. So understanding the fundamentals of hoof anatomy and conformation is a good starting point.

Sheep should have big feet with even toes that set flat on the ground and square with the animal's body. The hoof/pastern axis is important along with a good depth of heel.





A normal foot has a hard wall of horn around two claws, each with a softer sole horn at the base. In healthy sheep, the inter-digital skin between the claws is pale pink, dry and with a layer of fine hairs. The sole horn is only 2–3mm thick and easily damaged by thorns or other sharp objects. The wall horn bears the sheep's weight, so a normal foot has wall horn that is proud of the sole. Sometimes this wall horn curls over the sole horn. This may not cause the sheep harm, but it has been common practice to trim this horn away. Trimming may be needed where the hoof horn is severely overgrown or the sheep is lame. If sheep are lame with footrot or scald, treat with antibiotics then consider carefully trimming just the separated horn.

In a healthy foot the horn of both sole and wall is intact without smell, heat, softness or separated horn. If a sheep is not lame and their feet look reasonable, leave well alone.

Six causes of foot problems

There are six main causes of foot lameness identified in the National Flock, and effective management depends on correct identification. They are:

1. Scald (strip) – now seen as a pre-condition or early stage of footrot
2. Footrot
3. CODD – Contagious ovine digital dermatitis
4. Toe granuloma
5. Toe abscess
6. Shelly hoof

Predisposing conditions

Wet weather and mud predispose sheep to foot problems as persistently wet conditions make the skin and horn more vulnerable to infection. Mud balling between the claws causes considerable discomfort as well as potential infection. Gritty mud can creep between the horn and the white line causing separation and shelly hoof. Animals that are housed in unsanitary conditions are more susceptible to foot infections as are young lambs when first put out to grass. Poor bio-security can introduce CODD; overzealous foot-trimming can cause toe granulomas and abscesses.

AHDB's strategy - Identify, Treat, and Prevent

Identify and Treat

A very lame sheep will either be limping or not taking weight on the affected leg. She may not want to stand or be grazing on her knees. In motion the lame leg is the one upon which that she treads most lightly, the sound leg bears more weight. Another telltale sign is the head, which rises as the lame limb bears weight; and nods when weight is put onto the good leg. But remember she may be lame on more than one leg, so it's worth looking at all four.



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To examine thoroughly, clear the foot of debris and look for signs of soreness, swelling, heat, bleeding, pus or other abnormality in the foot. A foul smell will indicate footrot. Signs of pinkness indicate inflammation, perhaps showing scald. Lesions on the coronet band may make you suspect CODD. If there is pus then an abscess is likely. Toe granulomas are lumps of bleeding proud flesh extruded from the toe. Examination starts with the foot but if no obvious cause can be seen there then it may be further up the leg. Incorrect trimming causing poor foot balance can also cause lameness.

Good diagnosis will allow the correct treatment. AHDB's website has excellent photographs that can help you identify different conditions. And AHDB's *Target lameness for Better Returns* is available online and offers easy to understand information on the treatment of all these conditions. DEFRA'S Lameness in Sheep booklet is another excellent source of information. For health manuals from AHDB, see <http://beefandlamb.ahdb.org.uk/returns/health-and-fertility/>

Recent DEFRA advice has been to use an anti-biotic injection, enabling infection to be cured from the inside outwards, while also the sheep will walk properly, which helps keep the foot clean instead of favouring it, when it will fill up with mud and only get worse. This is not an easy decision for those of us trying hard to limit the use of such drugs for the long-term good of all of us in preventing resistance to anti-biotics! There is, however, evidence which shows it does work!

Prevention - Stop the problems before they start

So how can we avoid the problem arising? Extensive grazing and stock rotation can help minimise the build-up of bacteria on your pastures. After whole flock treatments, move the flock to a field that has ideally been free of sheep for 14 days. And keep an isolation field for sheep with footrot. Place water troughs in well drained areas and move feed troughs, creep feeders and forage racks regularly to avoid poaching and faecal contamination. Hydrated lime is useful for heavily used areas outside.

Remember warm, damp housing allows bacterial proliferation. Isolate and treat any sheep with footrot, scald or CODD and footbath the remainder. Diseased sheep must be housed separately.

When the sheep are housed ensure a good, thick layer of clean, dry bedding – wet bedding is a breeding ground for bacteria. The use of lime has a place indoors too, dusted around the doorways and feed areas before re-bedding.

Nutrition: Ewe are what you eat

Good nutrition with a good source of vitamins and trace elements make for sound, healthy feet. Soil and weather have an impact – soil that leaches minerals easily in prolonged wet weather (i.e. sandy soil) will have depleted supplies which will impact hoof growth.

Manufacturer Denis Brinicombe has formulated a bucket for sheep's feet which contains the vitamins, minerals and trace elements needed to strengthen and improve hoof growth and quality. See

<http://www.brinicombe.co.uk/agri/products/sheep-tubbys>

A small amount of Flowers of sulphur in feed (1- 1/5 oz per week) is good for feet, fleece and internal parasites too.





Growth versus Wear

A number of factors influence hoof growth, including breed and genetics. Soil characteristics, pH and levels of moisture in the soil also have an effect. Sheep grazed on rocky, dry ground will wear their feet more naturally so won't require the same level of hoof care needed for sheep on softer, wetter ground, where wear doesn't keep up with growth. And sheep in higher rainfall areas will need more regular inspection than those in drier areas, as they will be more vulnerable to foot problems. Wall horn grows at about 5mm a month and if growth matches wear, trimming is not necessary.

Less is more – trim only when needed

Once regarded as an essential component of sheep-keeping, the days of routine foot-trimming are over, simply because this practice offers no advantages to either sheep or shepherd. Many farmers have stopped this trimming and have seen fewer lame sheep. It is hard on the back, labour intensive, often produces more problems than benefits, and is counterproductive if performed badly. However, regular foot inspection and the ability to recognise and correctly diagnose problems are essential tools in keeping the flock sound. There are effective treatments for most causes of lameness that, if applied promptly, can reduce the prevalence in a flock.

Catch the ewe as soon as she's lame – leave her for more than four days and her body condition starts to fall. If you treat individual lame sheep immediately and take them away from the flock, spread of infection is limited and you have a better chance of a full recovery with good conformation, and a ewe that is less likely to be lame again. Examination of sheep's feet every 3 – 4 months will help catch infection before it becomes a chronic problem. Examine the skin between the claws as well as the hoof itself. It may not be necessary to trim every time you examine.

Lighter coloured hooves tend to be more susceptible, so these animals may need more frequent attention.

The right tools for the job

The right tools for the job are essential. Foot paring shears come in all shapes and sizes but choose one that handles comfortably as your hands will tire if they're too big or heavy. A double-sided paring knife and hoof rasp are useful too. Make sure your instruments are sharp.



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Trim a little and often rather than leaving it until large chunks of overgrown hoof need to be removed. Over-zealous foot trimming should be avoided. The purpose of foot trimming is to remove overgrown horn, leaving sufficient wall to take the weight of the sheep. The corium should never be exposed or the foot cut back so hard it bleeds.

Feet should be trimmed to ensure they don't become overgrown, removing only loose horn and ensuring the natural architecture of the foot remains intact. Inspect the hoof and remove any debris (e.g. mud, manure or stones) between the claws and from the walls of the hoof. A rotten smell is usually indicative of foot rot. The essence is to trim carefully and avoid cutting back too hard, especially at the rim of hoof wall so the sheep doesn't have to walk on the more sensitive sole. Leave a wall of 2-3 mm proud of the sole. The hoof/pastern axis is important.

Make it easy on yourself

Good handling systems will help prevent and manage lameness. Using hard, stone-free ground will avoid hoof damage. Portable handling systems offer the advantage of gathering all the sheep in the same place and avoids the whole flock being exposed to one contaminated area. Try to minimize the time they spend standing in collecting areas. Foot paring can be back-breaking work and there are various types of sheep handling equipment that can "hold" the sheep in a good position such as the sheep 'sofa' (opposite). Alternatively, the sheep can be turned over and sat on its hindquarters slightly tilted on one quarter or the other where she can remain comfortable for the duration of the trim.



Larger equipment, such as Ritchie's Combiclamp (below), is expensive but makes a huge difference in both time and effort if you have a large flock. This helps reduce the stress for both shepherd and sheep.



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Turn-over crates are useful too, but don't underestimate the strength you need to turn them, and remember sheep don't like being on their backs for too long.

It's easier to trim hooves that are soft from heavy dew or rain. Foot-bathing after trimming is a good management practice.

Hygiene is important so clean foot trimming equipment after each sheep to prevent spread of infection - a bucket of clean footbath solution will suffice. Keep the area you use for foot trimming clean and don't leave infected foot trimmings in the yard; dogs will take them away and the infection with them!

Foot bathing

Foot bathing can help improve flock welfare, productivity and profitability if completed correctly.

The objectives are to expose the bacteria that cause infection and to impregnate the hoof horn, at the point of its production. To achieve these objectives the feet of the sheep need to be clean, free from faeces and soil, so that the footbath solution can penetrate between the digits and reach the junction with the hoof. Scald can be controlled by foot-bathing and this will help limit the potential for footrot. However, it is not effective for treating footrot.



Try to footbath every time you gather but make sure they stay in the bath for the correct time for the product used. A good guideline for foot-bathing would be 5 times a year as routine; once a week if there is a problem.



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There are many products available on the market. The most important factor with foot-bathing is to follow the manufacturers' instructions, particularly the percentage dilutions and immersion time necessary to gain full benefit – time them according to product guidelines. Sheep should stand on a clean, hard surface and have their feet pre-washed before they go into the footbath solution. Stand on clean, dry surface for 20 – 60 minutes afterwards. Ideally turn out onto clean pasture (i.e. had no stock grazing for 12 – 14 days). A larger stand-in footbath is preferable to walk-through for zinc sulphate and will obviously hold more sheep so is time-saving. Sponge foot mats are also effective.

When foot bathing it is important to remember that formalin used at 3% can harden feet and seal in problems, making feet difficult to trim. Zinc sulphate on the other hand can be used without feet losing their natural elasticity."

Don't footbath in rain or mud. Straw put in a formalin footbath will render it useless, but will reduce the foaming of zinc sulphate. Foam rubber mats are effective for sheep. Don't alternate formalin and zinc sulphate as formalin will harden the horn and restrict the uptake of zinc.

Consideration must be given to disposal when deciding which product to use. A synopsis of the more commonly used products is available at the end of this information sheet.

The 'Stamp Out Lameness Campaign'

Footrot is clearly the most debilitating and difficult to manage of all the foot diseases affecting British sheep. With the aim of eradicating footrot, Farmers Weekly & the NSA in 2012 outlined a Five Point Plan that, with the aid of good fencing, commitment and dedication, should achieve its goals of a footrot-free flock. A number of clean pastures are needed to operate this programme (i.e. ground that hasn't had sheep grazing for 14 days).

Day 1	Examine all feet, trim carefully if necessary. Foot bath all sound sheep and move to clean grazing. Treat footrot infected sheep with antibiotics and foot bath in zinc sulphate, move to a separate clean pasture.
Day 5	Re-examine the infected group and re-treat with antibiotics where necessary and foot bath. Move to another clean pasture.
Day 10	Foot bath whole flock, and move any lame sheep into the treatment group move remaining sheep to clean pasture. Re-examine treatment group, move sound sheep to main flock, foot bath all remaining.
Day 15	Gather treatment group, examine, treat and foot bath move to further clean pasture.
Day 25	Re-inspect treatment group: any not fully recovered should be CULLED. Foot bath whole flock and move to clean pasture.



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Vaccination

Vaccination can be used to assist in an eradication programme. All sheep should be vaccinated at the time of the first gather, and this will help to treat as well as prevent footrot. Culling incurable carriers is extremely important. If the programme is followed, it is estimated that eradication is possible in closed flocks and for those with tight bio-security in 25 days. But, for most flocks, control rather than eradication is most practical.

NB: It is inadvisable to breed or buy replacements from sheep that have had scald or footrot. Susceptibility to footrot can be inherited so consider genetic indicators for resistance when available.

Synopsis of currently available footbath products

- **Aquatrace Sheep's Feet** is made by Devon-based mineral bucket experts. Containing synergistic minerals, salts, organic acids, zinc and iodine with a 'gumming' surfactant agent, its viscosity enables it to stick to feet, allowing good penetration without having to stand in it for a long time. Zinc contributes to the production of good quality horn. It's non-burning and non-toxic so safe for sheep and shepherd.
- **Cling-On Blue** is a combination of zinc and copper sulphates. 7kg makes 120 litres. Viscous and adhesive, it coats the hoof, has increased zinc contact and stays on for 3-4 days once dry. You do need a broom to mix it!
- **Copper sulphate (Bluestone)**: commonly used at 5-7% dilution. However, it is corrosive and very painful on raw wounds. It is toxic if sheep drink it and it stains their fleeces. It does remove granulation tissue.
- **Formalin** (Formaldehyde) is cheap, quick and easy to use. It should never be used in stronger than a 3% concentration as it will dry out their feet and make them brittle. It is painful on sore feet and only kills surface bacteria. It is also deactivated by contamination with organic matter (i.e. soil or dung), so must be clean and changed regularly. The fumes are very strong and toxic if inhaled. Protective clothing is needed as it is possibly carcinogenic. It can be left to evaporate.
- **Golden Hoof** (Zinc sulphate): mix in a 10% solution (i.e. 10 kg for 100 litres water). Generally the preferred chemical as it is gentler on the skin. Zinc sulphate with a detergent additive has excellent penetration if the sheep stands the bath for 20 minutes. This does make it more time consuming to use than some other products, but the great advantage is that it is still effective in the presence of organic matter and there are no toxic fumes. Dispose of away from watercourses.
- **Hoofsure** is a cost-effective concentrated footbath with a 24 hour activity period. It has a wetting agent which gives deep inter-digital penetration. It also strengthens and conditions hooves. It is biodegradable so can be disposed of on your muck heap or slurry pit. **Combat** is an easy-to-use film-forming spray that is good for scald.
- **Nettex Hoofphast** contains Benzalkonium chloride, a water soluble disinfectant. It protects for up to 48 hours and remains 100% active in solutions with up to 50% soiling for up to 2 weeks. Although relatively expensive, its conveniently measured sachets (20g x12) make it easy to use especially for small flocks.
- **Provita** market two new products which include organic acids, zinc and tea tree oil.



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Food additives and supplements

- **Calcium/zinc salt blocks:** for example recently re-formulated by Mole Valley as Calsea Sheep
- **Sea-Quim Elite food additive:** see <http://www.glensidegroup.com/seaquim-elite-asco-marine-meal>
- **Vitamin and mineral tubbies:** select those which are most suitable to deal with any soil deficiencies you may have

Topical options to support blue spray and hoof clippers

- **Pawz Dog Boots** can be used to protect a foot and keep it dry: see <http://www.amazon.co.uk/Pawz-LLC-1048-Waterproof-Boot/dp/B001J1Y9VA> or, if you don't like Amazon there's <http://www.ebay.co.uk/bhp/pawz-dog-boots> or search direct!
- **Sudacrem** works well to pack a foot, and is cheaper than the blue alternatives!
- **Camrosa** ointment is said to work for pretty much everything!

Sources

- There is a very good illustrated and detailed booklet on Sheep Lameness, worth downloading: from **Agrisearch** in County Tyrone, and in useful notebook format: see publications list on the Agrisearch website
- **FAWC** published their 2011 *Opinion on Lameness in Sheep*: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/325039/FAWC_opinion_on_sheep_lameness.pdf
- **AHDB** Sheep Manual 7 Target Lameness for Better Returns at <http://beefandlamb.ahdb.org.uk/wp/wp-content/uploads/2016/03/BRP-Reducing-lameness-manual-7-080316.pdf> and they also have videos, to be found at https://www.youtube.com/playlist?list=PLtImzmj0GoB6OmsNu_-nYWAtWIRcom0iR
- **DEFRA** Lameness in Sheep booklet <http://assurance.redtractor.org.uk/contentfiles/Farmers-5437.pdf> describes the main aspects of lameness and outlines some of the common sense management measures that will help prevent or treat the condition. These measures should help to ensure better welfare standards by reducing the level of lameness and, in addition, maintain or improve the efficiency of production.
- **SQM** (Scottish Quality Meat) also produces a booklet Lameness in Sheep with clear simple illustrations, see http://www.qmscotland.co.uk/sites/default/files/diagnosis_treatment_of_lameness_guide.pdf
- **NADIS** <https://www.nadis.org.uk/disease-a-z/sheep/lameness-control-in-sheep/>
- See also the downloadable booklet and information at <http://www.sheep-lameness.co.uk/Find-out-more-LamenessCostCalculator.aspx>

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