ANIMAL HEALTH IRELAND

Hoof HealthCheck FARM EVENTS

Norbrook

A PRACTICAL GUIDE TO IDENTIFYING, MANAGING AND PREVENTING LAMENESS



PRACTICAL DEMONSTRATIONS

EXPERT ADVICE

IMPROVE PERFORMANCE

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Hoof HealthCheck
FARM EVENTS

CONTENTS

Introduction	04
Why does lameness matter?	05
What are the main causes of lameness?	08
Lesions that cause lameness	09
Control, treatment and prevention of lameness	15

INTRODUCTION

Welcome to the Animal Health Ireland (AHI) Hoof HealthCheck guide, a practical resource to help you prevent, identify and manage lameness in your herd.

Designed as a practical reference for farmers, this guide brings together clear advice on the key areas that can make a difference to hoof health and lameness on farm.

Healthy hooves are an important part of a healthy, productive herd. Lameness is painful for the cow and can affect mobility, milk production, fertility and productive lifespan, while also adding cost and workload on farm. Early identification and prompt action can make a real difference.

Prevention starts by looking beyond the individual lame cow. Roadways, cow flow, housing, handling, footbathing and regular monitoring can all influence hoof health. Understanding these risks and identifying cows showing early signs of reduced mobility can help prevent minor problems from becoming more serious.

Inside this guide, you'll find practical advice on mobility scoring, common causes of lameness, roadways and cow flow, hoof lesions, footbathing, treatment and prevention. It is designed to help you identify the risks on your farm and take practical steps to reduce lameness.

Healthy hooves don't happen by accident. By spotting problems early, understanding the risks on your farm and taking practical action, you can improve cow comfort, reduce lameness and support a healthier, more productive herd.

WHY DOES LAMENESS MATTER?

Lameness is a painful condition that affects a cow's ability to move normally and is a major problem within the dairy sector worldwide. A recent Teagasc study showed that at any given time, one in ten Irish dairy cows is lame. The worst performing 20% of dairy farms in the study had a lameness prevalence of 15 – 32%.

A lame cow is in pain, is less willing to walk and may spend less time feeding or showing signs of heat. Reducing lameness is therefore an important part of improving cow welfare and maintaining healthy, productive herds.

There is also a significant financial impact. Lameness can affect milk yield and fertility, and may shorten the productive life of the cow. A shorter productive lifespan means that more cows are required to produce the same volume of milk, with implications for both farm profitability and the environmental footprint of milk production.

The cost of common conditions that cause lameness are found to be:

White Line Disease	▸ €226
Mortellaro	▸ €201
Foot Rot (Foul)	▸ €308
Sole Ulcer	▸ €536

A high prevalence of lameness in a dairy herd can be very frustrating and have a negative effect on the morale of those looking after the cows.

Lameness can also increase antibiotic use on dairy farms. However, most cases of lameness do not require antibiotic treatment. Reducing the number of lame cows and ensuring that cases are treated appropriately can therefore help to reduce antibiotic use and minimise the risk of antimicrobial resistance developing, which means antibiotics are not as effective as they were previously.

Lameness affects welfare, productivity, profitability and can have an impact on staff morale.

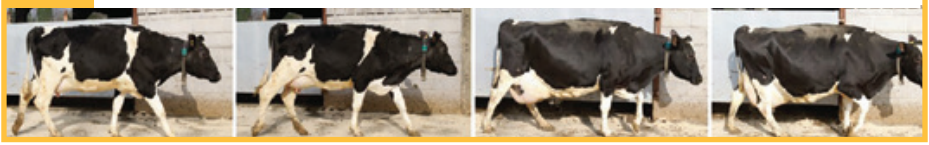


DETECTING LAMENESS EARLY

Early detection and treatment of lameness is key. The earlier lameness is caught the more successful treatment is. Chronic lameness can lead to permanent damage and poorer outcomes, while cows treated early are more likely to recover quickly. Regular mobility scoring is the most reliable way to pick up cows that are beginning to go lame before they become very obviously lame. Mobility scoring is simply watching cows walk and giving them a score based on how easily and comfortably they move. Several scoring systems exist; one straightforward system widely used in the UK is the AHDB 0 – 3 scale.

SCORE	DESCRIPTION	ACTION
0	Walks freely with no signs of lameness	No treatment required. Continue routine scoring.
1	Slightly imperfect gait, but mobility not affected	Monitor closely. Re-check at the next scoring session or sooner if the cow deteriorates.
2	Impaired mobility, clear signs of lameness with shortened stride or uneven weight bearing	Examine and treat as soon as is practically possible. Record the case and involve vet or hoof trimmer if needed.
3	Severely impaired mobility, cow is very lame and may be reluctant to walk	Treat immediately. Provide pain relief, seek veterinary input, and keep in comfortable housing until recovery.









Visit the AHI website for more information on Lameness

PHOTOGRAPHS: AHDB

WHY DOES LAMENESS MATTER?

Regular scoring allows farmers to identify cows requiring treatment or trimming at an earlier stage. It also provides a useful herd-level picture, helping to show how common lameness is and whether the situation is improving or getting worse.

Monthly mobility scoring is recommended. While it takes some time, building scoring into routine herd management can help protect cow comfort, improve recovery rates and reduce additional work and costs associated with more severe cases of lameness.

The AHI Hoof HealthCheck Technical Working Group have created a series of videos to demonstrate how to carry out mobility scoring, which are available here



WHAT ARE THE MAIN CAUSES OF LAMENESS?

More than 80% of the conditions that cause lameness occur in the foot, and more than 80% of these occur in the hind foot.

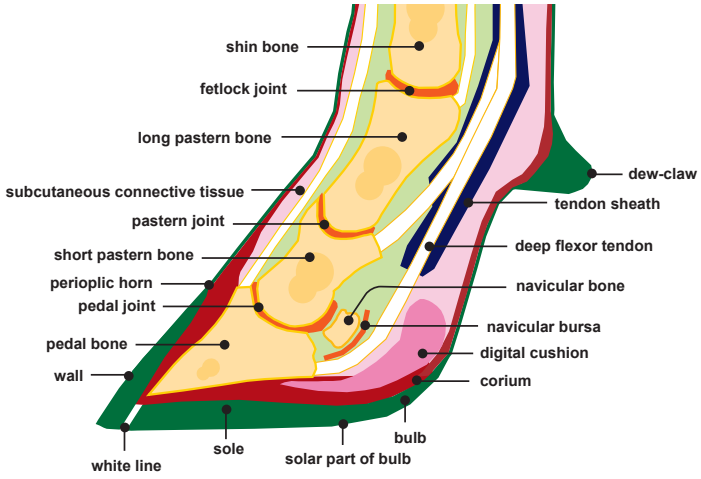
The main conditions affecting the hoof can be divided into non-infectious such as White Line Disease, Sole Bruising and Sole Ulcers, or infectious hoof lesions such as Digital Dermatitis (Mortellaro disease) and Foul of the Foot (Foot Rot).

A range of risk factors can contribute to these conditions. These can be grouped into four broad areas:

Environmental risks	Poor roadway surfaces, sharp bends, dirty or overcrowded housing, and inadequate space in- collecting yards, cubicles or feed space.
Management risks	Poor handling, infrequent monitoring, inadequate foot bathing, or purchasing infected stock.
Nutritional risks	Thin cows (post calving) or where dietary changes occur too rapidly.
Individual cow risks	Linked to calving stress, previous lameness, age, or genetics.

WHAT IS THE ANATOMY OF THE NORMAL HOOF?

It is important to know the anatomy of the hoof, to understand how lameness develops and how to prevent it.



LESIONS THAT CAUSE LAMENESS

COMMON NON-INFECTIOUS LESIONS CAUSING LAMENESS

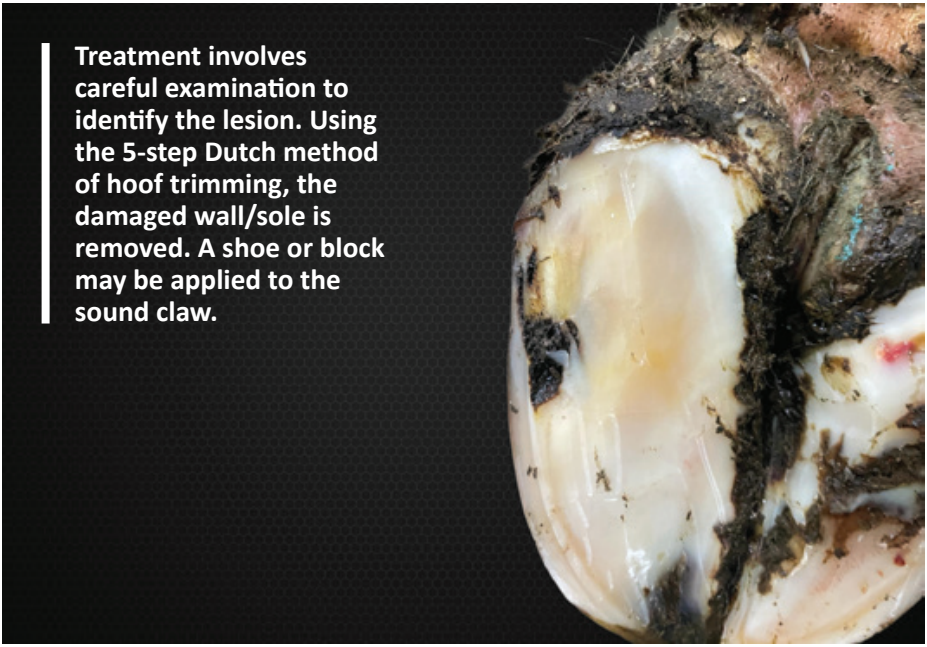
White line disease

The white line is the junction where the horn of the sole is joined to the horn of the hoof wall. It is the weakest part of the sole and is most vulnerable to damage.

Physical trauma and shearing forces, such as those that occur when turning on a hard surface, can result in loose stones and grit penetrating the white line. Such penetration leads to entry of infection, inflammation, and resultant lameness. White Line disease is the most common lameness condition seen during the grazing season.

Equally, small traumas to the sole of the foot can, over time, damage the white line. Small stones or grit can gradually penetrate through the white line, reach the quick and cause an inflammatory reaction resulting in lameness.

Reducing the traumas and keeping the impact of those traumas to a minimum will help reduce the number of lameness cases that occur on your farm.



Treatment involves careful examination to identify the lesion. Using the 5-step Dutch method of hoof trimming, the damaged wall/sole is removed. A shoe or block may be applied to the sound claw.

NON-INFECTIOUS LESIONS CAUSING LAMENESS

Sole bruising

This is due to damage to the germinal layer of cells ('quick') that are responsible for producing sole horn. Excessive standing on concrete, excessive body condition loss and worn claws due to excessive walking can all contribute.

Treatment for sole bruising involves examining the feet, resting the cow and keeping her on a soft surface until she recovers. If only one claw is affected, a block can be applied to the unaffected claw.

Reducing the traumas and keeping the impact of those traumas to a minimum will help reduce the number of lameness cases that occur on your farm.

Sole ulcer

A sole ulcer is essentially a much more severe case of a sole haemorrhage. The 'quick' is so severely damaged that some cells no longer produce horn. A complete hole in the sole results allowing the sensitive 'quick' to protrude. This leads to a very painful lameness condition.

Treatment for sole ulcers requires careful examination of each claw, the removal of sole overgrowth using the 5-step Dutch method and the trimming of underrun horn and sharp edges. To relieve pressure and facilitate healing, a block can be applied to the sound claw.



ROADWAYS AND COW FLOW

Irish dairy cows experience two distinct environments during the year: the outdoor grazing environment and the housed environment. They also pass through a milking facility. Each of these environments needs to be considered when assessing the risk of lameness.

For grazing herds, good-quality, well-designed and regularly maintained roadways can play a major role in preventing lameness. Roadways need to be wide enough to allow cows to move at their own pace without feeling pressured. For herds of 120 cows or fewer, the recommended width is four metres, with an additional metre for every extra 100 cows.

The roadway surface should have a layer of fine dressing material, be free from sharp stones and be kept in good repair. This helps reduce hoof trauma, sole bruising and white line damage. Good drainage is also important. A camber with a 3–5% fall from the centre of the roadway towards the edge is recommended, while slopes greater than 8% can be uncomfortable for cows.

Trees and scrub alongside roadways should be managed so that the surface has an opportunity to remain clean and dry. Paddock entrances should be wider than the roadway to reduce bottlenecks, while unnecessary distractions such as water troughs, other animals or changes in surface should be avoided where possible.

Particular attention should also be given to where roadways meet concrete. Stones carried onto concrete surfaces can cause significant trauma to the hoof, so these areas should be kept clean and stone free.

Understanding how cows naturally walk is an important part of preventing lameness. When given enough time and space, a cow checks the surface in front of her, places her front foot in a safe position and then places her hind foot in approximately the same place.

Particular attention should also be given to where roadways meet concrete. Stones carried onto concrete surfaces can cause significant trauma to the hoof, so these areas should be kept clean and stone free.

When cows are packed too tightly together, their heads are raised and they cannot properly examine the surface ahead. This makes it more difficult for them to choose a safe place to put their feet.

Cows also have their own walking order on roadways, which may differ from their milking order. When they reach the collecting yard, they need sufficient time and space to rearrange themselves before entering the parlour.

For this reason, cows should be allowed to walk at their own pace. Avoid pushing or rushing cows on roadways with dogs or quad bikes. Allow them to leave the milking parlour at their own pace and avoid keeping them in collecting yards for longer than necessary.

To reduce lameness, look beyond the individual cow and consider the environment and management of the whole herd.



ROADWAY CLASSIFICATION

INDEX 1



Roadway with rough surface, loose stones, likely to damage cows' hooves, will lead to poor cow flow and cows using single-file path.

INDEX 2



Roadway, some loose stones and poor surface at edge.

INDEX 3



Roadway, excellent surface, resulting in good cow flow.

INFECTIOUS LESIONS CAUSING LAMENESS

Foul of the foot (Foot Rot)

This is an infection affecting the tissue between the digits causing severe pain and swelling. Consult your vet regarding treatment as this involves antibiotic treatment. Early detection and prompt treatment give the best results.

Mortellaro disease (Digital Dermatitis)

Digital Dermatitis, more commonly known as Mortellaro, is an infectious disease that causes extremely painful lesions in the skin close to the hoof. It is contagious and can spread rapidly through a herd. The incidence of Mortellaro has risen steadily in recent years due to its contagious nature.

Indoor housing, overcrowding and dirty conditions are major risk factors that increase the spread of this condition. A recently published paper in the Veterinary Ireland Journal (Conneely, M. and E. Ryan 2024) calculated the cost of a case of Mortellaro to be approx. €200 per cow. This calculation included treatment costs, farmer time, reduced milk yield, increased calving interval and cost of extra services to achieve a pregnancy.





Mortellaro is caused by bacteria which are active and motile and survive in slurry for a short time (less than 24 hours), but slurry provides a very effective short-term transmission medium to spread this infection from cow to cow.

It is important to understand that the Mortellaro lesions themselves are the main reservoir of infection, shedding the infection into the environment and increasing the risk to uninfected cows. It takes an average of 4 months for an active Mortellaro lesion to develop (Krull et al.,2016).

Treatment involves cleaning and drying of the lesion, applying antibacterial products to the affected area for 3-4 days. However, these bacteria have the capacity to become encysted in the hair follicles of the skin, leaving the cow as a carrier with a dormant lesion, which can recur at a later stage.

Treating individual cows only when obvious lesions appear is therefore unlikely to control Mortellaro at herd level. A regular foot bathing programme is an important part of preventing the spread of infection and reducing recurrent flare-ups.

CONTROL, TREATMENT AND PREVENTION OF LAMENESS

GETTING FOOTBATHING RIGHT

Foot bathing regularly is an essential element in the control of digital dermatitis. It allows a disinfectant solution to be applied to each cow's hooves, which will kill infectious agents and improve hoof hygiene.

Good cow flow through the footbath is essential. Ideally, the bath should be positioned close to the milking parlour exit and should not involve cows stepping up or down. A footbath three metres long and 850 mm wide works well for herds of up to 250 cows. For larger herds, a width of at least 2 metres can help improve cow flow. Solution depth should be 100- 125 mm. Knowing the volume of the footbath is important so that the correct concentration of product can be used.

- A bath 3 m long, 850 mm wide and filled to a depth of 100 mm holds approximately 255 litres.
- For different size footbaths, use the calculation:
  - » Length x Width x Solution Depth = Xm^3. (To convert m^3 to litres, multiply it by 1000) x 1000.

So if you have a 200-cow herd, you need a minimum of 200 L of solution to foot bath the whole herd at once.



A good rule of thumb is to allow one cow passage per litre of solution before changing.

The frequency of footbathing depends on the prevalence and severity of Mortellaro within the herd. Where new lesions are appearing regularly, footbathing may be required after every milking until the disease is brought under control. Once under control, regular footbathing should then continue, with at least weekly footbathing throughout the year.

Farmers should consult with their vet or advisor about the most appropriate product and routine for their herd. Antibiotics are not licensed for use in footbaths.

Foot bathing is not a substitute for the other important management practices that prevent lameness and is only part of a larger lameness management plan. It is worth noting that, if foot bathing is not done correctly, it will be completely ineffective at best, or at worst may actually contribute to the spread of disease.

TREATING THE LAME COW

Once a lame cow has been identified, treatment should take place promptly. Lameness is painful, and the aim should be to identify the cause, relieve pain and give the cow the best opportunity to recover.

Treatment will depend on the lesion involved. Hoof trimming may be required to identify the cause, correct the weight-bearing surface, remove excess or underrun horn or allow an abscess to drain. A shoe or block may also be placed on the unaffected claw to take pressure off the painful area.

Rest is also important, and lame cows should not be required to walk unnecessary distances. Digital Dermatitis may require topical treatment and a bandage, while some bacterial infections, such as Foul of the Foot, may require antibiotics.

Most cases of lameness, however, are caused by non-infectious conditions, such as sole haemorrhage, sole ulcers and White Line Disease, and therefore do not require antibiotics.

MANAGING LAMENESS IN YOUR HERD

Lameness is painful, and managing pain is an important part of treatment. Non-steroidal anti-inflammatory drugs (NSAIDs) reduce pain and inflammation, helping cows feel more comfortable, improve their appetite and return to normal behaviour more quickly.

Research has shown the benefit of combining pain relief with early treatment. In one UK study, 56% of lame cows treated with NSAIDs, alongside a trim and block, had recovered after five weeks, compared with 36% of cows that received a trim without NSAIDs.

Timing was particularly important. Of cows treated with NSAIDs, trimming and a block within two weeks of becoming lame, 85% recovered, compared with just 16% of cows that had been lame for more than two weeks before receiving the same treatment.

Your vet can advise on the appropriate use of NSAIDs as part of the treatment of lame cows.

Early treatment matters. The longer a cow remains lame, the more difficult successful recovery can become.

If lameness is a problem on your farm, it might sometimes feel like there is very little you can do to improve the situation. The good news is that by adopting certain simple measures and following a structured approach, you can reduce the prevalence and severity of lameness on your farm.

The first step is to identify which cows are affected and what is causing the problem. Routine observation and regular mobility scoring are essential for identifying affected animals before their lameness becomes severe. Regular scoring allows farmers to spot subtle signs of reduced mobility before the condition becomes severe.

Once a lame cow is identified, action should be taken within 24 hours. The sooner treatment begins, as well as addressing underlying issues such as housing or roadways, the better the outcome.



KEY STEPS

- Train staff to identify early signs of lameness.
- Set up a regular mobility scoring routine (monthly at least).
- Have a treatment protocol ready, including when to call a vet or trimmer.
- Keep accurate records to identify patterns or repeat cases.

The next step is to look at the risk factors that may be contributing to the problems and complete a full risk assessment of your cow's environment. Some risk factors are more obvious than others like poor roadways. But others, like inadequate space in the collecting yard or feeding areas or rushing cows are less obvious. Insufficient space in collecting yards or feeding areas, poor cow flow and rushing cows, can all increase the risk of lameness.

Once these risks have been identified, develop a plan to reduce or remove them. The plan should contain realistic actions and timelines, and should be reviewed regularly to monitor progress and determine whether adjustments are necessary.

Infectious and non-infectious causes of lameness require different control strategies, making it important to understand what is driving lameness within your own herd.

HEALTHY HOOVES START WITH PREVENTION

Lameness is much easier to treat in the early stages. Cows treated promptly have a much higher chance of recovery, while allowing lameness to become chronic can dramatically reduce the likelihood of a successful outcome.

Farmers, hoof trimmers and vets all have a role to play in reducing lameness on dairy farms. Once lameness risks are understood, practical improvements can be planned and implemented. Significant reductions in lameness prevalence and severity are possible by working together as a team and adopting a cow-centric approach and moving from simply treating lame cows to preventing lameness from occurring in the first place.

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The Technical Working Group would like to acknowledge AHDB for the use of their mobility scoring chart and imagery in the production of this leaflet.

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REFERENCES

All references are available upon request to ahi@animalhealthireland.ie.

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