

Lesion recognition and trouble shooter guide

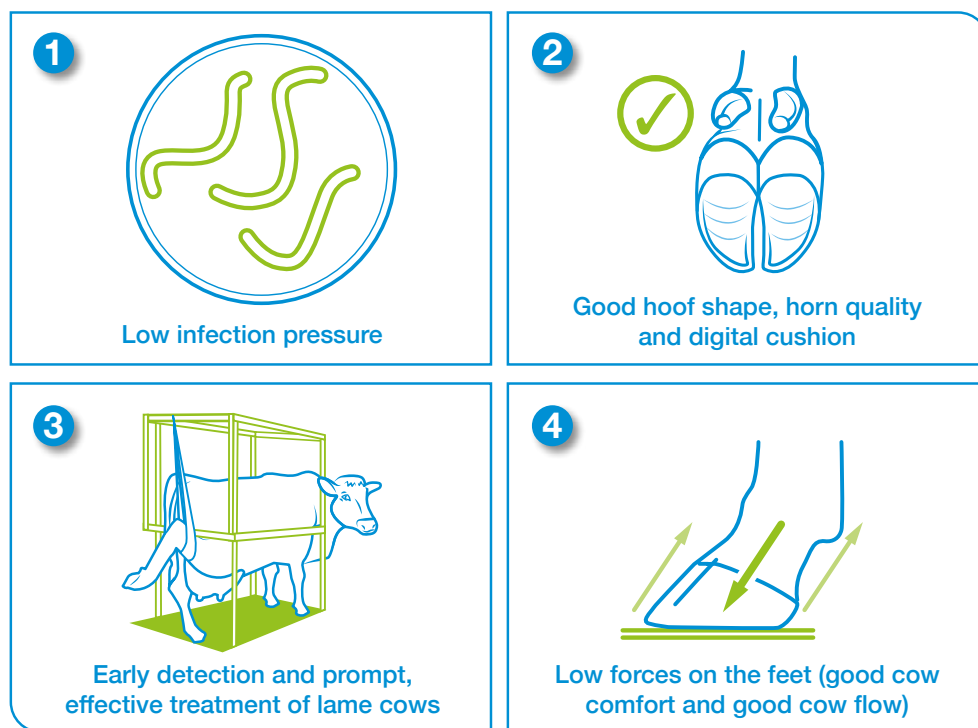


Figure 1. The four key success factors for healthy feet

Lame cows cost time and money and are a problem. No one wants to see cows not walking correctly and herd lameness can have effects on staff morale as well as the image of dairy farming.

Lameness is a term that covers many conditions: some are caused by infection (e.g. digital dermatitis) and some by physical factors (e.g. sole haemorrhage and sole ulcers). All types of lameness are affected by management factors. Use this document to further your understanding of which types of lameness are present on your farm. Coupled with knowing the typical risks and the success factors associated, it will help you to better recognise the issues presented.

Figure 1 indicates the **four key success factors** for healthy feet.

For each of the lesions, this troubleshooter indicates the typical risks which are important to pay attention to.

Some success factors are particularly important for reducing certain conditions. For example, white line disease is very dependent on success factors 2 and 4.

Early detection and prompt effective treatment is important for **all** lameness.

In 2015, the International Committee for Animal Recording (ICAR) launched its Claw Health Atlas which aims to standardise the definitions used across countries. The naming and code for each disorder is in line with this atlas.

Non-infectious/claw horn lesions

Sole haemorrhage (SH)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> In very mild forms, the sole discoloration is yellow to pink More severe is red to purple Caused by damage to the corium (pressure) leading to leaking serum or blood being incorporated into new sole horn Discolouration towards the toe, or even the entire sole often points to the sole being too thin Also known as sole bruising 	Poor acclimatisation to concrete floors and/or cubicles	2 and 4
	Too much time standing and poor cow flow – see WLD and SU	4
	Thin soles	2 and 4
	Possibly dietary factors: loss of support for pedal bone; reduced digital cushion (thin cows/weight loss); possibly acidosis leading to biotin deficiency	2

Non-infectious/claw horn lesions

Sole ulcer (SU)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> A pressure point exists towards the back of the sole leading to poor horn formation and bleeding in the horn. Sole ulcers progress from sole haemorrhage The ulcer develops from within the deeper layers of the sole. Once the outer sole horn has been removed, flesh (the corium) can be seen protruding through the ulcer site When present, they are often on outer claws of both hind feet 	Excess time standing; poor cubicle comfort; long milking times; long lock-up times; overcrowding; heat stress	4
	Thin cows; cows losing weight after calving; old cows with less shock absorbing capacity from the digital cushions	2
	Poor support of pedal bone, for example around calving period; possibly dietary factors too	2
	Overgrowth of sole thickness; excessive wall abrasion/abnormal wear, often associated with concrete floors	2
	Long toes; eroded heels; poor foot/leg conformation	2
	Not enough bedding; poor grip on cubicle surface; too-small cubicle dimensions for size of cow and lack of cubicle training	4
	Poor attention to fresh-calved cows and heifers, for example, hierarchical stress	4
	Slow detecting and treating early lameness (at bruising stage)	3
	Incorrect foot trimming method	3
	Previous inflammation in the foot causing bony changes, and possibly hardening of the digital cushion; for example, delayed treatment or failure to use NSAIDs in treatment of early sole ulcers	3

Non-infectious/claw horn lesions

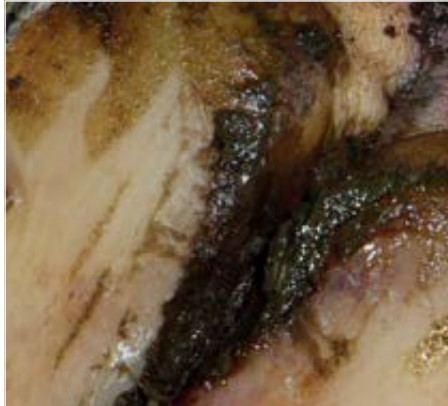
White line disease (WLD)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> In mild cases, the horn of the wall can be seen separating slightly from the horn of the sole, at this junction, known as the white line. Sometimes, there is blood staining (bruising) More severe cases become infected: pus is seen Pus can track up the wall and burst at the coronary band or under the sole to burst at the heel (creating a double sole) 	Poor grip on floors; sharp turns; overcrowding and dead-end passages; bulling cows, no loafing area	4
	Stockmanship factors; rushing along tracts, pressure during herding and rough use of backing gate; poor cow flow in collection yard	4
	Poor tracks: wet, stony ground; long distances and long standing times	4
	Rough concrete; new concrete (due to being rough, but also chemical horn damage)	4 and 2
	Poor acclimatisation to concrete floors	2
	Weak horn: eg nutritional imbalance (for example, biotin deficiency); wet feet	2
	Thin soles: eg over-trimming; too much abrasion; walking long distances	2

Mixed: infected claw horn lesions

Non-healing lesions (WLD & SU)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> These are lesions which do not heal despite competent trimming and blocking The primary lesion is usually a claw horn lesion which has become secondarily infected, typically with digital dermatitis bacteria 	<p>These conditions stem from an initial claw horn lesion, so attention to those risk factors are important</p>	<p>2 and 4</p>
<ul style="list-style-type: none"> Toe necrosis is a separate example of a non-healing lesion, where the tip of the pedal bone has become infected 	<p>Non-healing lesions/difficult-to-cure lesions often involve secondary digital dermatitis infection on the exposed corium (quick), so attention to infection pressure is important. Other bacteria are involved too</p>	<p>1</p>
<ul style="list-style-type: none"> Veterinary attention is necessary for non-healing lesions (unless culling) as surgical debridement or digit amputation are the treatments of choice, which both require local anaesthesia 	<p>Slow reaction to treat the lesions, or ineffective initial treatment, is often the underlying reason why claw horn lesions become infected</p>	<p>3</p>

Mixed: infected claw horn lesions

White line abscess, under-run sole, wall ulcer



Description	Typical risks	Associated success factors
White line abscess <ul style="list-style-type: none"> White line disease with infection causing pus. Pus usually eventually escapes ('bursts out') at the coronary band or the heel bulb if not treated promptly 	<p>These conditions all (usually) stem from an initial white line disease, so all the factors are important</p>	2 and 4
	<p>Infected white lines with delayed healing can be associated with superimposed DD infections</p>	1, 3 and 4
Under-run sole <ul style="list-style-type: none"> These occur most commonly from a white line abscess whereby build-up of pus has caused separation of the sole horn from the underlying corium May also be secondary to infected sole ulcers, again with build-up of pus. Sometimes multiple layers of under-run soles (or 'false soles') occur 	<p>Slow detection and treatment of early lameness</p>	3
	<p>Poor treatment protocol or technique</p>	3
	<p>Poor acclimatisation to concrete floors</p>	2
Wall ulcer <ul style="list-style-type: none"> This is the colloquial term for a white line abscess which has burst out at the coronary band, exposing the underlying corium; often become secondarily infected and become a non-healing lesion, sometimes with protruding granulation tissue ('proud flesh') 		

Infectious

Digital Dermatitis (DD)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> An infection of the skin caused by a type of bacteria Raw, painful erosion of skin, most commonly above the heel bulbs Can also be found at front of feet or between toes Chronic forms have rubbery hairs sprouting from the lesion 	Infected cows in the herd (including chronic carriers)	1 and 3
	High proportion of herd affected	1
	Poor farm biosecurity (for example, bought-in stock; failure to disinfect between farms)	1 and 3
	Poor hygiene (for example, failing to disinfect foot-trimming equipment)	1
	Wet feet; constant contact with slurry which weakens natural skin defences	1 and 2
	Poor footbathing protocol, including dirty footbaths	1
	Poor slurry management: housing; auto-scrapers with waves of slurry (no slats); overcrowding/not enough space/uneven floors and puddles	1 and 2
	Excess time standing (feet do not dry out)	4
	Poor immunity (eg stress, poor diet or concurrent diseases)	1 and 2

Infectious

Heel horn erosion (HHE)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> • Caused by enzymes produced by certain bacteria which erode the horn at the heel • Severe forms can lead to deep pits and grooves • Useful weight-bearing surface of the foot is lost and the condition can be sore in its own right 	Build-up of causative bacteria – dirty feet; poor footbathing	1
	Constantly wet feet; poor slurry management	1 and 2
	'Caking' of feet: dirty environment and poor foot cleaning	1 and 2
	Excess time standing in passageways (instead of lying down)	4

Infectious

Foul of the foot/interdigital phlegmon (IP)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> The whole foot is swollen Characteristic smell Caused by bacteria which enter through broken skin between the claws A very aggressive form is called 'super foul' 	Other infected cows	1
	Too slow treating other cows, or they are not treated fully	3
	Damage to skin between claws: for example, sharp stones, prickly straw, stony ground around troughs/gateways, coarse sand, hard earth (summer)	2
	Poor footbathing	1
	Warm, wet conditions; muddy gateways or troughs in spring or autumn	1

Interdigital hyperplasia/growth (IH)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> Protruding flesh (fibrous tissue) between toes Caused by any chronic irritation, eg by the bacteria responsible for heel erosion or foul Can become super-infected with digital dermatitis 	Any irritation between toes, including slow or partial treatment of foul, DD or heel horn erosion; sand irritation	3
	Chronic irritation from bacteria which cause heel erosion: dirty feet	1 and 2
	Sometimes a breed predisposition (hereditary/genetics)	2
	Poor hoof conformation; long toes and splayed feet	2
	Inadequate/delayed treatment of foul of the foot	3

Less common lesions

Toe necrosis (TN)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> • 'Rotten toe' • May start as toe ulcer or split wall with deep infection often involving bone • DD bacteria may be involved, infecting exposed corium and preventing healing 	May follow a toe ulcer which has become infected	2, 3 and 4
	Secondary infection includes DD bacteria (more typical on farms with uncontrolled DD)	1
	Many of these lesions are associated with split inner hoof walls, DD may be the primary cause of necrotic toes or a secondary invader, after a toe ulcer	1 and 3
	Too slow at detecting and treating early lesions, particularly DD (at the front of the hoof)	3

Toe ulcer (TU)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> • Ulcer located at the toe • Particularly painful • Often precipitated by thin soles 	Thin soles: whether from over-trimming, long tracks, poor tracks, poor cow flow, new concrete, wet (soft) feet or rough surfaces	2 and 4
	Stony ground: stones can cause a point force on bottom of sole which affects sole corium (particularly if sole horn is thin: grazing herds)	4

Bulb ulcer/heel ulcer (BU)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> • Ulcer further back on the foot than a typical sole ulcer • Sometimes tracks back to heel 	The risks are likely to be similar as for sole ulcers, but it is less well understood why some herds seem to suffer the ulcer lesions in this location	2 and 4

Less common lesions

Axial horn fissure (AHF)



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> Appears as a white line defect on the inner wall Vertical crack in the inner claw wall Sometimes hard to spot 	Poor grip on floors; sharp turns; overcrowding and dead-end passages; bulling cows, no loafing area	4
	Rushing along tracks; pressure during herding and rough use of backing gate; poor cow flow in collection yard	4
	Poor tracks: wet, stony ground; long distances and long standing times	4
	Rough concrete; new concrete (due to being rough, but also chemical horn damage)	4 and 2
	Poor acclimatisation to concrete floors	2

Foreign body



Description	Typical risks	Associated success factors
<ul style="list-style-type: none"> Sharp stones or other objects Do not confuse with stones getting stuck in sole ulcer sites 	Caused by penetration of sole by sharp objects, including stones, roof tacks, screws; more likely with soft sole horn (wet feet); thin soles (over-trimming or over-wear); recent building works; poor choice of walking surface (eg road planings)	3 and 4

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