Lameness field guide
A pocket guide to on-farm treatment of lameness
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ISBN 978-1-925347-13-5 Print

Acknowledgements
Some of the content of this publication includes material supplied by DairyNZ and input from lameness specialist Neil Chesterton.
Why is lameness important?

› Lame cows represent a financial cost to your farm business and, therefore, impact on profitability.
› Lame cows produce less milk, lose weight and take longer to cycle.
› Lame cows take time, energy and skill to treat properly.
› Lame cows suffer pain and, consequently, lameness is an animal welfare issue on Australian dairy farms.

Lameness is not an easy problem to fix. It is caused by many factors that differ between individual cows and farms. Reducing the number of lame cows in your herd requires a long-term, planned approach that is supported by the whole farm team.
Understanding cow behaviour

Lameness is commonly the result of a negative alteration in the way cows walk or interact with the herd. In order to prevent lameness, it is critical to first discuss normal cow behaviour.

› Cows need to see where their feet are placed.
› Subordinate cows will not pass dominant cows.
› Dominant cows walk throughout the herd, not always at the front.
› Milking order is different to walking order.
› Cows need space in the yard.
› Under pressure, dominant cows push forward using back feet. Lower dominance cows reverse, using front feet to brace and push.
› Cows are creatures of habit.

Good stockmanship

Good stockmanship is another way to help prevent lameness in your cows

1. Ensure enough cow space in the yard.
2. Use backing gate correctly:
   › Movement no longer than 5 seconds duration.
   › Delay first movement until at least 2 rows/platforms are milked.
3. No heads up!
4. Use a consistent routine for handling cows.

Scan QR code to watch
Cow behaviour and stock handling video
Treatment tool kit

Essential
› Hoof knives – 1 x right handed, 1 x left handed
› Hoof knife pouch (old teat-cup liner)
› Hoof tester
› Hoof trimmer
› Straps or pulley for lifting leg
› Soft rope for securing foot
› Back bar or rope or support belt for cow
› Antiseptic spray
› Cowslips or blocks
› Sharpening stone
› Diamond hoof knife sharpener
› Fine round chainsaw file
› Glove or wrist protector
› Disinfectant.

Optional
› Paring hoof knife, rasp or angle grinder with sanding disc
› Antibiotic
› Methylated spirits.
Minimising lameness

Cows spread out, heads down
Cows need space in the yard. Space allows a cow room to manoeuvre gently forward and feel and look for a safe place to stand.

Cows standing upright
When cows are relaxed in the yard feet are at normal angle to the yard surface and have low risk of being damaged.

Cows bunched, heads up
Heads up suggests that the whole herd is too tightly packed. This will result in foot damage from twisting and turning and standing on gravel.

Cows pushing at an angle with their feet
Cows pushing at an angle with their feet are avoiding pressure from the backing gate or top-gate. Pushing at an angle like this will damage the white-line of the foot. (see page 10 & 11 for description of white line).
**Rocks and gravel on concrete**
Rocks and gravel on concrete damage and penetrate the sole. They are painful to walk on. This results in poor cow flow into the shed.

**Clean concrete**
Clean concrete is less damaging to a cow’s foot. Use a nib wall or curb at the junction between gravel and the concrete to prevent gravel being brought onto the yard surface.

**Cows bunched up on laneway**
This is caused by herding pressure from behind. Bunching often happens at congestion points on the laneway. The result is poor foot placement and damage to the sole from laneway material.

**Cows spread out on laneway**
If cows are spread out and able to drift at their own pace, foot placement is good and wearing of the sole is minimal.
Knife sharpening

Step 1 Correct angle

Only when a knife is first purchased use a rough stone, a file, or an angle grinder to change the inner angle (straight and curved cutting edge) of the blade to 20 degrees (see illustration). The knife edge should be gradually tapered.

Always sharpen the inside edge of the knife.

Too steep Correct Angle

Step 2 File the edge

Use a fine chainsaw file, a fine grain stone or diamond hoof knife sharpener (illustrated). File the sharpened edge again. Ensure consistent angle.

Scan QR code to watch a video on how to sharpen hoof knives
**Step 3**  Protect blade

Protect the blade while not in use inside an old teat cup liner, piece of polythene tubing or leather cover.

**Step 4**  Sharpen regularly

Touch the blade up regularly with a diamond sharpener.

When sharpening a knife, have it securely held to ensure a consistent and sharp edge.
What does a normal foot look like?
**Coronary band**
Joins the hoof and the skin. A pale hairless band.

**Wall**
Grows from the coronary band downward at a rate of approximately 5mm per month. Made of tough horn.

**Pedal bone, or distal phalanx**
Connects with other bones in the hoof to give the hoof flexibility. Tendons allow the bone to move forwards and backwards in normal movement. Protected by the digital cushion and corium.

**Sole**
Grows down directly from beneath the pedal bone. This horn is softer than the wall horn. The sole is joined to the wall by the white line.

**Bulb**
Merges with the inside and outside wall and the sole continuous with the coronary band. A soft rubbery part of the hoof.

**Digital cushion**
Acts as a shock absorber, bearing the weight of the cow as she steps onto her foot.

**Coffin, or distal interphalangeal joint**
Allows the hoof to flex. Prone to injury involving the attachment of the deep flexor tendon to the pedal bone. The tendon can separate and the toe of the claw will turn up.

**Corium**
Supports the pedal bone within the hoof wall.
What does a normal foot look like?
Heel bulb
Merges with the inside and outside wall and the sole. A soft rubbery part of the hoof continuous with the coronary band.

Inner claw (medial)
Controls direction and carries more weight than the outer claw in front hooves. In the front hooves the inner claw is slightly larger.

Outer claw (lateral)
Controls direction and carries more weight than the inner claw in rear hooves. In the hind hooves the outer claw is slightly larger.

Interdigital space
The space between the inner and outer claws. This space can become impacted with debris.

Coronary band or coronet
A pale hairless band at junction of hoof and skin. Area at the top of the hoof from where the hoof wall is produced.

Wall – axial or centre, and abaxial or outside
Grows downward from the coronary band approximately 5mm per month. Made of tough horn.

White line
Junction where sole meets hoof wall. Runs from the bulb of the heel to the toe and then back along the first third of the inside wall. Softer than the wall and sole. It, it is a point of weakness and often the site for wedged stones and entry of infection.

Sole
Sole horn is softer than the wall horn.
## Lameness scoring

<table>
<thead>
<tr>
<th>Score</th>
<th>Walking speed</th>
<th>Stride</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Confident. Similar walking speed to a person. Maintains position in the herd.</td>
<td>Long, even and regular. Rear foot placement matches front foot placement.</td>
</tr>
<tr>
<td>1</td>
<td>Not normally affected, should easily maintain position in the herd.</td>
<td>May have uneven stride and/or rhythm. Rear foot placement may miss front foot placement.</td>
</tr>
<tr>
<td>2</td>
<td>May be slower than normal; may stop, especially when turning a corner.</td>
<td>Shortened strides rear foot placement falls short of front foot placement.</td>
</tr>
<tr>
<td>3</td>
<td>Very slow, stops often and will lie down in paddock. Cannot keep up with the healthy herd.</td>
<td>Shortened and very uneven. Non lame leg will swing through quickly.</td>
</tr>
</tbody>
</table>

### Lameness Scoring

- **0**: Walks evenly
  - No action required
  - This cow is normal

- **1**: Walks unevenly
  - Minor action required
  - Record and keep an eye on her – some cows normally walk unevenly

- **2**: Lame
  - Action required
  - This cow is lame and needs to be recorded, drafted and examined within 24 hours

- **3**: Very lame
  - Urgent action required
  - This cow is very lame and needs urgent attention. Draft and examine as soon as possible

For more information on lameness scoring go to healthyhooves.dairyaustralia.com.au/lameness-scoring

Scan QR code to watch a video on lameness scoring
Lameness scoring

Healthy Hooves Lameness field guide

Weight bearing  Backline  Head

Evenly placed and weight bearing when standing and walking.  Straight (level) at all times.  Held in line or slightly below the backline and steady when walking.

May stand or walk unevenly but difficult to identify which leg/s are affected.  Straight when standing, may be mildly arched when walking.  May have slight bob and/or may be held lower than normal.

Uneven – lame leg can be identified.  Often arched when standing and walking.  Bobs up and down when walking.

Lame leg easy to identify – ‘limping’; may barely stand on lame leg/s.  Arched when standing and walking.  Large head movements up and down when walking.

For more information on lameness scoring go to healthyhooves.dairyaustralia.com.au/lameness-scoring

Lameness scoring is an essential tool to measure how well your prevention plan is working.

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Which foot is lame?

To identify which foot is lame use the following rules.

**Rule 1 Front foot**

Walk the cow around the yard. If her front foot is lame she will raise her head as the foot is placed on the ground.

**Rule 2 Back foot**

If her back foot is lame she will lower her head when the foot is placed on the ground. She will also have a smaller stride for a lame back leg.
Treatment facilities

Farms should have appropriate facilities for treating lame cows.

Good facilities make it easy to provide prompt treatment and ultimately improve your lame cow management.

The health and safety for both cow and operator are important aspects of any treatment facility.

Scan QR code to watch a video on how to restrain a cow
How to examine a lame cow
8-point dairy cow hoof examination

1. Observe the cow walking. **Which leg is the cow lame in?**
   - **Head down?** Hind limb.
   - **Head up?** Fore limb.

2. **No** Is the leg swollen and obviously painful above the hoof? **Yes**
   - No swelling present.
   - **Think of infections like footrot.**
   - Note: Always check for wire or similar wrapped around leg/claw.

3. **No** Observe the external surface of both claws on the lame leg and compare with the external surface of hooves on the other feet. **Yes**
   - Are cracks present in external surface of the hoof wall of the lame leg?
   - No abnormality detected in either claw on the lame foot.
   - **Vertical or horizontal cracks present – possible sand crack(s)**

4. **No** Restrain cow in suitable facility and secure the affected leg with a rope or strap. **Tip: Use a second person to apply a ‘tail jack’ while attaching the rope.** Thoroughly clean the external surface with a brush and water. **Yes**
   - Is there soft tissue swelling with foul smelling discharge and dead and damaged skin in the interdigital space?
   - No abnormality detected in the interdigital space.
   - **Footrot or a hard fleshing swelling or growth – possible Fibroma or a foreign body (gravel or stone), or foreign body penetration (wire) and injury of the axial wall, or an axial wall crack.**

Scan QR code to watch a video on how to examine a lame cow

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Carefully pare or sand away the superficial outer surface of the sole and trim any overgrown wall horn (double sole). Sole horn may be very thin so be careful not to reduce the weight bearing surface around the edge of the hoof more than necessary.

**Is there abnormal discolouration in the sole horn?**
Do not confuse with normal pigment (usually black).

- No visible discolouration.
  - Red or bleeding lesion on sole at the sole-heel junction – sole ulcer?
  - Red/purple smudges in the sole itself – bruised sole?
  - Red paint splash spots/lines in the sole horn – Laminitis?
  - Black/dark lines or cracks in the sole – sole penetration and/or under-run sole. Pare away until no black horn, dirt or pus remains detected. Check for presence of foreign body – stones/nail.

**White line – expanded and filled with mud and gravel, especially towards heel area?**

- No apparent abnormality detected.
  - White Line Disease – separation of wall from sole – check for abscess breaking out at the coronet? Trim or grind hoof wall back to normal tissue to allow drainage.

**Use hoof testers over the sole to gently squeeze the sole against the wall searching for sensitive areas which cause withdrawal reflex (flinching).**

- No apparent abnormality detected in either claw or hoof.
  - Withdrawal response detected
    - **Bruising** – rest.
    - **Toe/foot abscess or under-run sole** – trim, pare or grind until loose sole horn removed back to normal horn.
    - **Pus detected** – establish drainage.

**Seek veterinary advice as lameness may be associated with upper leg abnormality.**
How to restrain a cow

Step 1
Get an assistant to ‘tail jack’ the cow by gripping the tail near its base and lifting it up and forward over the cow’s spine. When applied correctly this will prevent the cow kicking.

Step 2
Pick up the lame leg.

Step 3
Using a quick release knot secure the leg to the rail. If possible, have an assistant hold this rope, rather than tying it.

Scan QR code to watch a video on how to restrain a cow

Be aware!
If a cow drops to her knees, with her head in the bail, this may put pressure on her windpipe, suffocating her.

Putting a strap/belt under her chest can prevent this.
How to put a block or cowslip on

A block or cowslip goes on the good claw, not the injured claw.

Step 1
Clean the foot thoroughly, then using a paring knife scrape the sole and wall clean. An angle grinder with sanding disc may be used.

Step 2
Dry the foot with methylated spirits or a hair dryer.

Step 3
Check the block or ‘cowslip’ for size. If necessary you can cut the block or ‘cowslip’ then refer to glue mixing instructions.

Step 4
Apply the block or ‘cowslip’ onto the healthy claw and allow the glue to dry.

Remember to record your lame cow treatments datagene.com.au

Scan QR code to watch a video on how to block or cowslip
There are six major types of lameness in Australian herds.

**White Line disease**
White Line disease is separation of the wall of the hoof from the sole.

**Sole bruising**
Sole bruising is a visible area of bruising under the surface of the sole.

**Footrot**
Footrot is a bacterial infection with a putrid odour found between the claws.
Sole injury

Sole injury is a term used to describe three possible conditions associated with damage to the sole – sole penetration, sole abscess and under run sole.

Axial wall crack

An axial wall crack is a crack of the inside of the toe at the join of the hoof wall and sole.

Digital dermatitis

Digital dermatitis is the infection of the digital and/or interdigital skin with erosion and initially painful ulcers, which become chronic and less painful (but can still be infectious).
White Line Disease

What you will see
› ‘Break out’ or abscess at the coronet (top of the claw) may occur.
› Wall is split away from the sole and the space between them may be filled with sand and gravel.
› If both front feet are affected a cow may stand and walk cross-legged.
› When side wall is trimmed a dark line can be found running vertically up the hoof from the sole sometimes to the coronet.

Scan QR code to watch a video on how to treat white line disease
How you treat it

Step 1
Open up the white line at the bottom and the top to allow drainage.

Step 2
In most cases you will need to remove the whole side wall.

Step 3
Take the weight off the injury by paring or apply a block ‘(or cowslip)’ to the uninjured claw.
What you will see
› Dark hole or crack on sole leading to pocket of pus.
› Not always obvious.
› Hoof testers usually produce a response over the penetration – cow will flinch or try to pull away.
› In heifers, presentation is often at the toe.

Scan QR code to watch a video on how to treat sole injuries
**How you treat it**

**Step 1**
Open up hole or crack in hoof and release any build up of pus.

**Step 2**
Pare away all under-run horn (separated sole) to ensure drainage and prevent build-up of pus.

**Step 3**
Apply a cow slip or block to the good claw to relieve pain by removing weight bearing role of the affected claw.
Sole bruising

What you will see

› The sole has reddish / dark brown areas. Don’t confuse with normal pigmentation.
› Patches can be localised or they can cover large portions of the sole.
› Often the cow is lame in more than one foot.
› Cow often stiff when getting up and walking.

Scan QR code to watch a video on how to treat sole bruising
**How you treat it**

**If one claw is bruised**

If only one claw is injured apply a cowslip or block, to the uninjured claw.

This will keep the bruised claw off the ground and immediately relieve pain.

**If both claws are injured**

If more than one claw is affected, but there is only pain in one claw, a cowslip or block may be applied to the non-painful claw. If both claws are painful, keep the animal close to the shed.

*Simple bruising should heal fairly quickly.*
Footrot

What you will see
› Skin between claws is broken.
› Swelling and heat below the dew claws.
› It often smells.
› Often occurs in wet conditions.
› Common to find a stone or stick between the claws.
**How you treat it**

**Step 1**
Explore the split between the claws with a finger to check for foreign objects such as buried stones, or sticks.

**Step 2**
Clean the cleft removing any foreign object or dead tissue. **Note:** This can be very painful and the use of pain relief may be required. Consult your vet.

**Step 3**
Spray the cleaned cleft with an antiseptic/iodine.

**Step 4**
Check claws for other lesions, for example sole abscess or white line disease requiring treatment.

**Step 5**
If necessary, begin a three day course of intramuscular antibiotics, prescribed by your veterinarian.

Scan QR code to watch a video on how to treat footrot
What you will see

› A vertical crack on the inside wall of the claw.
› Crack starts at the coronet (interdigital skin/axial wall junction) and grows down towards the sole.
› A pain response may occur if the hoof testers are used to squeeze the inner (axial) wall against the outer (abaxial) wall.
› A small area of proud flesh might be visible under the dark gravel-filled cavity.
› The wall is under-run upwards toward the interdigital skin and down to the sole.
How you treat it

Step 1
The skin between the claws is often extremely sensitive. Check for any stones.

Step 2
Carefully remove all the under-run horn on both sides of the crack.
If the crack extends down the axial wall to the sole then pare away the wall and sole, next to the crack, to transfer weight bearing to the outer healthy wall of this claw.

Step 3
Check the block or cowslip for size. Will it fit? If necessary trim the claw or the edge of the block or cowslip so it is not rubbing against the skin.

Scan QR code to watch a video on treating axial wall cracks
Digital dermatitis (Hairy Heel Wart)

What you will see

› In its early stage it looks like a raw grey/brown ulcer at the back of the foot. Cleaning with water reveals the red surface of the ulcer.
› These ulcers then develop into warts. Some of these may extend between the claws.
› The infection may get deeper into the hoof, causing erosion and under-running of heel horn, especially if left untreated.
› Eventually the ulcer or wart may appear to heal naturally or shrink to a very small scar, but may still be a source of infection to other cows.
› Painful to begin with causing ‘shifting’ lameness. Less or no pain as it becomes chronic.
How you treat it
Seek veterinarian advice. It is important to accurately diagnose the disease.

Step 1
Tie up the foot.

Step 2
Clean the ulcer or wart with water.

Step 3
Dry and then spray with an antibiotic spray from your veterinarian.

Step 4
Let the spray dry for 10–15 seconds and then apply again.

Step 5
Lower the foot and then let the cow stand for 10–15 minutes on clean concrete.

Step 6
Repeat the treatment for two more days.

› Severe outbreaks can be prevented with hygiene to keep the feet clean and foot-bathing of every animal.
› Ongoing control is by use of footbaths with antiseptic solutions on a regular basis.
How you prevent it

› Digital dermatitis is usually introduced by bringing infected animals (cows, bull or heifers) onto a farm.
› All introduced animals should be checked and foot-bathed before mixing with a clean herd.
› Once digital dermatitis becomes established in a herd it seems impossible to get rid of it.
› Avoid cows standing in slurry whenever possible.
› Install a foot-bath for monthly sanitizing of feet as a precaution.

Scan QR code to watch a video on digital dermatitis