

Lameness Control in Dairy Herds

Part 6 - Foot bathing

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Unhygienic conditions underfoot are a major cause of skin infections in the feet, including foul-in-the-foot and digital dermatitis. They also contribute to heel erosion. Taking steps to improve foot hygiene and introducing foot disinfection (foot bathing) can be extremely effective and rapid ways of improving foot health. However, if foot bathing is performed incorrectly it can contribute to the rapid spread of infections, contaminated baths could pose a mastitis risk, and the chemicals can burn the skin or cause severe pain on open sores.



Fig 1: Cleaner and drier feet are fundamental to reducing lameness

Significance - cost-benefit

Digital dermatitis probably affects over 40% of cows in infected herds making it one of the most common causes of lameness and foot disease in UK dairy cattle, costing the average farm roughly £3000 per 100 cows per year. The cost of conditions such as foul-in-the-foot, superfoul, interdigital fibroma and heel erosion are less clearly defined. Even harder to define are the costs in terms of ulcers on the sole, toe, heel or wall that become chronically and severely infected due to unhygienic conditions, or the extra bruising due to soft sole horn and eroded heels. The cost of foot bathing will vary according to the regime and chemical you use, but if 5% formalin is used daily, the cost to fill a 200 litre bath is approximately £750 per year per 100 cows making it an extremely cost-effective control measure.

Good foot hygiene prevents spread of infections

Digital dermatitis is highly infectious, appearing to spread in slurry, mud, dirty water and contact with infected equipment. Infection rates have been correlated with body hygiene scores. Therefore, the best prevention for foot infections is to keep feet clean and dry.(fig 2a, 2b)



Figs 2a &b: Crusts of slurry on the front of claws (left) or on dew claws (right) indicates exposure to deep slurry, and are risk factors for heel erosion or spread of digital dermatitis (right). Deep slurry will often mean front lameness becomes common too as slurry extends above the deeper front heels.



Fig 3: A box scraper will scrape cleanly, especially along kerbs, but will also save labour time making it an extremely cost effective investment.

When cows are housed, clean dry conditions are more easily achieved with straw yards (with wide, regularly scraped concrete feed passages). (fig 4) Similarly, one contaminated passageway, one pool of water or a pool of slurry can undo this. Heel skin and the rings on the wall of claws will be visible with clean conditions.



Fig 4:An alley with width and drainage for clean feet.

Practical steps to improving yard hygiene include:

- Increasing bedding depth, especially straw or sand. This will help overall cow cleanliness and can help mastitis control.
- be maintained in a clean state. Having ready access to hand scrapers makes the job easier.
- Investing in a better yard scraper (fig 3)
- Removing sources of slurry pools e.g. repairing yards, removing temporary slurry pools, creating drains and kerbs.
- Ensuring housing is not overstocked, alleys are wide and alleys are on a 3% slope for drainage. In some cases alleys can be widened (e.g. removing a tractor feed passage and feeding from the cow passage) or a loafing area created.

Intermittent whole herd treatments - treating the 'hard-to-see' lesions

Infections will persist and develop even when cattle feet are clean while at pasture. Whole herds can be easily treated for digital dermatitis every 1-6 months using a footbath containing an appropriate concentration of antibiotic, copper sulphate (1-3 days per week), formalin (2-3 days per week), organic acid or some other effective treatment. Various regimes are available according to the product being used. Please consult your veterinary surgeon for further details on the most suitable product for your herd (see end for more details). To be effective the following points should be considered:

- The feet must be clean to allow the solution to reach the skin. For housed cattle this is best achieved by power washing but not pressure washing. Feet should be allowed to dry.
 - A 'pre-wash' water bath (fig 5) should be used whenever possible to preserve the concentration of the active agent in the treatment bath.
 - Enough active solution must be present to maintain activity for the last cow through the bath. The rough rule of thumb is 100 cow passes per 100 litres in the footbath. If in doubt, the solution should be refreshed during milking and never left without being refreshed for more than 48 hours.
- farm contributing to overall spread, especially as they calve down.



Fig 5:A well designed footbath with pre-wash and agent bath

It may be possible to spray treatments on the heels of the whole herd (the ones that are safe if accidentally inhaled as aerosols), reducing the necessity for footbaths and regular changing of baths. Treating all milking cows in this way will address many unseen lesions. However, the most sustainable and effective way of managing infections is not through treatment but through prevention by reduced the spread, preventing the cost of disease. As mentioned earlier, even when foot hygiene is excellent, daily foot disinfection may be beneficial for preventing digital dermatitis.



Fig 6:A 6" drain, bung and string pull.



Fig 7:A double width bath with bung, over-flow, and parlour washing divert

Daily foot disinfection

Clean feet can be very difficult to achieve e.g. when automatic scrapers are used or when cubicle passageways are narrow in relation to number of cows, size of cows and dry matter intakes (milk yield). In many instances, the only means of improving foot cleanliness may be with a regular

foot disinfection protocol. Daily foot disinfection is probably one of the most cost-effective ways of improving foot health in a herd with digital dermatitis. In order to make it practical, a simple 'easily fill, easy clean' footbath is required. This usually consists of:

- A six inch diameter drain with quick release bung (available from a plumbers merchant) (fig 6)
- A means of diverting parlour washings to the bath (fig 7)
- A hose and tap for washing and filling.

Special consideration should be paid to cow flow and dispersal. A single width bath is best placed far enough away from a parlour to avoid queues out the parlour. For large herds, a double width bath is recommended. A 1.8m wide and 3m long bath will hold 540 litres if filled to the recommended 10cm. This is enough for 540 cow passes.

Common and effective foot bathing regimes

Footbaths can be used as a treatment or foot disinfection. In most situations, both treatment and disinfectant baths should be alternated. If 5% formalin is available, then the simplest regime is to use this every day. Cost can be reduced by using formalin for the treatment and parlour washings as a disinfectant on the days between treatments.

<i>Chemical in bath</i>	<i>Use</i>	<i>Frequency and concentration</i>
Antibiotic	Treating digital dermatitis	As directed by your vet
Formalin ¹	Weekly 'treatment' ³ Daily disinfectant	3 consecutive days at 5% Daily at 5%
Copper sulphate ²	Weekly 'treatment' Daily disinfectant	1-2 days per week at 5% Daily at 2% (add mild, dilute acid)
Peracetic acid	Daily disinfectant	Daily at 1%- never miss treatment
Hypochlorite	Daily disinfectant	Daily at 2%- never miss treatment
Parlour wash	Daily disinfectant	Final rinse - never miss treatment

Table: Foot bathing regimes

¹Health and safety precautions must be followed.

²Seek advice on land toxicity

³Treatment for digital dermatitis, foul, heel erosion and to some degree, soft soles from new concrete

Treatments (and possibly disinfection) should be continued through the summer. A number of commercial products are available some of which appear to be effective. Foot bathing is best planned with your vet as part of your herd health plan.

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