

Lameness Control in Dairy Herds

Part 5 - Digital Dermatitis - Causes Treatment and Control

Nick Bell MA, VetMB, PhD, MRCVS

Bovine digital dermatitis is an infectious condition of the foot cause by bacteria called Treponemes. It was first reported in Italy in 1974. Since its appearance in the UK in 1987 it has spread widely and is thought to affect at least 70% of UK herds. Within infected herds approximately 41% (0-67%) of cattle have lesions although generally only a small proportion of these (2.8 cases per 100 cows per year, range 0-69.5) are individually treated in most herds. Lesions can have a highly variable appearance (Figure 2a-e below) and can be found at a range of sites including the classic site on the skin around the heel (Figure 1 right), under the heel horn, on the coronary band, on the skin between the claws, under the dew claws, on the pastern skin and on the udder skin.



Fig 1: Heel lesion.



Fig 2a: An erosive lesion, with watery discharge. These are often very painful and frequently bleed on cleaning.



Fig 2b: The strawberry-like granulomatous lesion, often covered with a grey layer of dead tissue.



Fig 2c: The dark, crusty appearance of a healing lesion which is not painful.



Fig 2d: The fronds of a 'hairy wart' which are painful.



Fig 2e: Mixed lesions which can contain any combination of lesion types above.

Cost of disease

The estimated costs associated with digital dermatitis are probably inaccurate and under-estimates of the true cost. Many cases of complicated interdigital growths, chronic toe infections, chronic wall infections or defects, severe heel erosion, severe sole ulcers, severe cases of foul-in-the-foot and udder sores are associated with uncontrolled digital dermatitis and are not included in the calculations. Estimated cost per case vary from £75 to £81.49, making the annual cost per average farm roughly £3000 per 100 cows. Like sole ulcers, much of the cost is related to milk yield loss and increased calving interval (Table 1 below)

Table 1: Production and welfare statistics regarding digital dermatitis

Measure of production and welfare	Impact of digital dermatitis compared with unaffected cows*
Reduced milk yield	Various estimates of milk yield loss: - 57 litres - 1.7% reduction
Infertility - Calving to 1 st service	20 days longer

**Impact comparisons are generally made between cows individually treated for digital dermatitis and those that haven't received treatment. Many infected cows will fall within the untreated group as most are treated in the footbath or eventually recover without treatment. Therefore, these costs are likely to be an underestimate.*



Fig 3a: Coronary band infection..



Fig 3b: Infected interdigital growth.

If digital dermatitis is affecting front feet, then this can cause more severe lameness and would indicate exposure to deep slurry somewhere on the farm.



Fig 3c: Toe infection.

Biosecurity - preventing new strains of digital dermatitis entering a herd

Once a herd is infected, digital dermatitis appears to be impossible to eradicate (but can be very effectively treated and prevented at individual animal level). There are several species of Treponemes causing digital dermatitis, which, when combined together, can potentially produce more severe disease. This means even herds with digital dermatitis are likely to benefit from strict biosecurity. Therefore, all herds should consider biosecurity to prevent digital dermatitis. Possible measures include:

- Closed herd status, including hire bulls, or buying from herds certified free from infection by a vet.
- Providing boot and tyre disinfection facilities for people or vehicles that enter cow yards.
- Never using claw trimming equipment that has been used on other farms.

Individual cow treatment - reducing the reservoir of infection

Cows affected with digital dermatitis are usually easily spotted by the way they behave: they appear to walk on their toes and they shake their feet while stood. The lesions can also be spotted by hosing off the heels in the parlour and using a bright light to identify abnormal heel skin. While it is quick and simple treating cases by spraying treatment in the parlour, it is probably more effective to first inspect the foot in a crush.



Trimming using the Dutch 5 step method (see previous module) is essential to rule out claw lesions before assuming digital dermatitis is the only problem. Trimming away eroded heel horn may reveal digital dermatitis under the heel and may improve the penetration of treatment.



Fig 4: Provide disinfection facilities.

The majority of digital dermatitis lesions respond very well to a combination of:

- Simple cleaning (running water or a brush in disinfectant such as 1% hypochlorite)
- Hygienic drying (e.g. disposable blue towel)
- A generous application of a licensed antibiotic spray or copper gel. Antibiotics should be allowed to dry. While bandaging with antibiotic powders has proven extremely successful, this is an off-license treatment.
- Returning to a clean, dry yard following treatment, avoiding exposure to slurry and mud that could interfere with the newly applied treatment.
- Repeat the treatment daily for at least 3 days

The wart-like lesions are likely to benefit from hygienic trimming back with a sharp knife prior to

spraying. However, it is important to avoid cutting into the sensitive (and bleeding) tissues, and knives should be disinfected before and afterwards. Severe and very painful cases, including infections on interdigital growths, will benefit from surgical removal under local anaesthesia by a veterinary surgeon combined with a course of injectable antibiotic. These animals are worth treating as they will represent a major and continual source of infection for the rest of the herd.

Controlling digital dermatitis at the herd level

One visible infection will represent the tip of the iceberg with many other cows bearing lesions which are more difficult to see. These animals represent an important reservoir of infection for the rest of the herd. Probably the best way to treat the herd is to walk the whole herd (including dry cows and groups of youngstock that appear infected) through a footbath containing antibiotic, formalin, copper, zinc or an organic acid preparation at the appropriate concentration for 3 consecutive days (see later module). Feet must be clean for this.

Footbathing every 1-6 months can be very effective at treating the herd for digital dermatitis. However, in most instances the digital dermatitis will return within a few weeks if the spread of infection and re-development of old lesions is not addressed. Regular (daily) foot disinfection (see later module), hygiene at foot trimming and steps to improve yard or pen hygiene are most effective for this. To monitor this, assess the number of cows with lesions (hose off feet in the parlour) and assess cow cleanliness.



Conclusion

Digital dermatitis is a relatively simple infectious disease to control given attention to treating the animals that are the reservoir of infection and reducing the spread of infection. This can be summarised as:

- Treating the reservoir
 - Individual animal treatment
 - Herd treatment - footbaths (see later module)
 - Foot hygiene - better scraping, removing sources of deep slurry, water or mud. Feet are naturally cleaner with deep straw beds or at pasture.
 - Foot disinfection e.g. daily 5% formalin, salt water or similar

While treatment will undoubtedly help control the disease, preventing spread will result in less production loss and will be more cost effective.

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