

AABP FACT SHEET

DIGITAL DERMATITIS (HEEL WART)



Authored by the
**AABP LAMENESS
COMMITTEE**

Digital dermatitis (DD) is a multifactorial superficial dermatitis of the digital skin of cattle. The most common site is the palmar/plantar interdigital ridge of the foot—especially the rear feet (**Figure 1**), but other sites include the skin of the interdigital cleft, the heel, sometimes under-running the sole, and the dorsal aspect of the coronary band (**Figure 2**), where they may be associated with a vertical wall crack. Necrotic lesions of the anterior udder have also been associated with the infection.

Early lesions are erosive, circular or oval with clearly demarcated raised borders. Lesions may become red and granular or develop filiform papillae (**Figure 3**) which are associated with the papillomatous form—known as the hairy heel wart.

The lesions are very painful due to exposure of nerve endings, and many have a characteristic odor believed to be caused by breakdown of keratin and secondary bacterial infection.



Figure 1. Typical granulomatous appearance to a DD lesion at the plantar aspect of the interdigital space.



Figure 2. An atypical DD lesion located on the dorsal aspect of the coronary band.

Pathogenesis

Once introduced via the addition of new cattle to the herd, DD spreads rapidly, especially among the first and second lactation animals.

Spirochetes from the genus *Treponema* have been identified consistently from lesions. However, DD has not been created experimentally using any of the organisms identified alone, only by using an exudate from active DD lesions. The disease therefore appears to be multifactorial in nature, requiring infectious, immune and environmental components.

Constant moisture and low oxygen tension are required for infection to occur, suggesting that wet, manure contaminated conditions are a pre-requisite for the organism(s) to penetrate the skin surface.

Younger cattle appear to be more affected than older animals, and some cattle never develop lesions, suggesting a degree of resistance. New cases are observed more commonly in early lactation, suggesting that immune suppression around calving time may be a factor in the pathogenesis.

Important Things to Know About Digital Dermatitis

- DD is a multifactorial disease with infectious, immune and environmental components
- Spirochetes from the genus *Treponema* are believed to be the infectious cause
- Lesions typically occur on the plantar aspect of the interdigital cleft and may be ulcerative, granulomatous or papillomatous in nature
- Topical antibiotic treatment is effective
- Foot hygiene and foot bath management are important aspects of control

Other Predisposing Factors

Conformation may predispose individuals to infection, with low heel heights increasing the likelihood of disease.

The disease is more common in free stall housing compared to tie stall and straw bedded barns, and within free stall

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Digital Dermatitis (Heel Wart) *continued*



Figure 3. A severe DD lesion with filiform papillae typical of the papillomatous form of the disease

barns, use of automatic scrapers appears to increase the risk by making cows step through large waves of manure as they progress through the pen.

DD appears to have been recognized with increasing frequency in beef cattle including feedyards and animals similarly housed in dry lot conditions.

Care should also be taken with regard to movement and use of trimming equipment between farms, and adequate disinfection is essential.

Treatment

A range of topical antibiotics are effective, but all are extra-label uses in North America requiring records of use. The lesion should be cleaned and dried and the antibiotic applied with a dressing or topical spray.

For topical spray treatments, oxytetracycline (mixed at 10–25mg/ml) or lincomycin (mixed at 1–8mg/ml) are effective when mixed with distilled or deionized water in a 2–4 liter agricultural sprayer and applied once or twice daily for 5–7 days. Alternatively, the prepared solution of antibiotic (50–100 mg/ml oxytetracycline or 8 mg/ml lincomycin)

can be soaked into a gauze swab and wrapped on the lesion.

A number of non-antibiotic commercially available alternatives exist that may also be active topically for the treatment of individual cows.

Parenteral antibiotics may be indicated for severe lesions, especially those on the dorsal aspect of the claw, but they are secondary to topical treatments and should not be used alone. In severe cases, a NSAID may also be indicated.

After-care

Animals should respond quickly to treatment. Wraps should be removed after 3–4 days when the lesion can be checked for signs of healing (drying, darkening and absence of pain). Lesion recurrence rate 7–15 weeks after treatment may be high (60% has been reported).

Prevention

Hygiene is the most important control measure for DD. Reducing exposure to manure and avoiding chronic wetting of the foot are paramount in reducing the risk of DD. Factors which improve leg hygiene include freestall pen design (2-row pens have 20% more surface area than 3-row pens), grooming of corrals to avoid wet areas, reducing stocking density, frequent manure removal from alleyways by scraping or flushing at least three times per day, and maintenance of watering and feeding areas to avoid mud accumulation. Foot baths will help clean and disinfect the interdigital skin and are an integral part of DD control for most dairy herds. Note that foot baths should not be used to treat active lesions—they are meant to control the spread of infection by regular disinfection in much the same way that we use teat dipping to control the spread of mastitis pathogens. A range of different products are effective including copper sulfate (5%), zinc sul-

fate (5–10%), formalin (2–5%), and commercial chemicals containing quaternary ammonium compounds, organic acids, and other disinfectants. Recently, several new products which serve to activate copper sulfate have been released which allow lower concentrations (2%) to be used.

It is essential that the volume of the foot bath is known so that the correct amount of chemical may be used to provide the appropriate final concentration. The volume in gallons may be calculated from the formula; length × width × depth (in inches) divided by 231.

Foot baths should be at least 8 feet long and 5 inches deep and as wide as the alley way that they are located in. They are commonly placed in the return lanes from the parlor or in a transfer lane. Whatever the location, the alley must be wide enough to provide an alternate route around the bath when it is not in use. Wash baths sited in front of the treatment bath are optional, but if used, there should be a 6 foot gap in between them, to prevent carry over of wash solution into the treatment bath, and dilution of the chemical. The floor of the bath should be non-slip, but not too rough or ridged as this will prevent cows from wanting to walk through it.

Foot bath frequency is determined by leg hygiene and the extent of the DD problem in a herd. In highly contaminated situations, bathing twice daily for at least 5 days per week is necessary, whereas in cleaner more hygienic conditions a bath run once per week may be sufficient.

Because of the susceptibility of early lactation animals, foot bathing should begin in the close-up period and be aggressively implemented in early lactation. **AABP**