

# Beware of Digital Dermatitis

Veterinary epidemiologist says the source of lameness is a growing cattle health issue with significant animal welfare implications.

by **Troy Smith**, field editor



**W**orldwide, digital dermatitis is considered to be the most prevalent infectious foot disease of cattle. So says Dorte Dopfer, a University of Wisconsin veterinary epidemiologist and one of the world's leading experts on digital dermatitis. The lady knows just about all there is to know about it. However, even Dopfer admits that digital dermatitis is not understood nearly well enough.

According to Dopfer, "After decades of digital dermatitis being known as an infectious claw disease that leads to severe lameness, the etiology is not clarified, the complications and clinical course of the disease are studied in unstandardized ways, and no solution for the elimination of this disease is in sight for either beef or dairy cattle."

Once thought to be a "dairy problem," digital dermatitis is estimated to affect a majority of dairy herds and up to 20% of all

dairy cattle. The disease plagues feedlots, too, reportedly occurring sporadically in some

locations and prolifically in others. There is no published data regarding incidence, but clinical observation suggests feedlot incidence rates as high as 50% in pens of affected cattle.

It is clear to Dopfer that digital dermatitis is a growing cattle health issue with significant animal welfare implications.

Obviously painful, the disease causes lameness becoming more pronounced over time. Feedlot personnel need to know that a good many lameness cases may be

mistakenly attributed to foot rot, when the real culprit is digital dermatitis.

Prolonged cases of digital dermatitis can

pave the way for secondary infections resulting in foot rot, but the typical foot rot remedies — injectable antibiotics — don't yield satisfactory results when administered for digital dermatitis. Dopfer emphasizes the need for cattle caregivers to look for and recognize digital dermatitis early, so more effective treatment can be administered before cases become chronic.

"Neglected, digital dermatitis can become irreversible," states Dopfer.

## Recognizing the problem

If they are unfamiliar with the term "digital dermatitis," some cattle folk may have heard the condition referred to as strawberry foot, raspberry heel or, most commonly, hairy heel warts. They really aren't warts, but the disease results in ulcerative lesions, the appearance of which has been likened to warts.

Lesions resulting from digital dermatitis typically appear on that part of the foot where skin and hoof horn meet. Often red



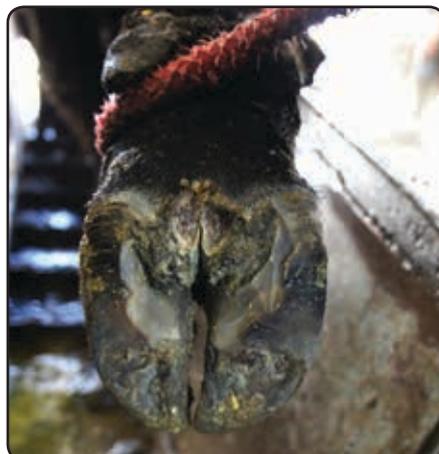
PHOTO BY TROY SMITH

► "Neglected, digital dermatitis can become irreversible," says Dorte Dopfer, a University of Wisconsin veterinary epidemiologist and one of the world's leading experts on digital dermatitis.

**Fig. 1: The wrapping process in a sequence of pictures from beef cattle starting with discovery of the soiled, dirty M2 lesion, the quarter**



The M2 dermatitis is the size of a quarter.



Cleaned and trimmed hoof and dermatitis.



Apply 2cc of LA200 or similar medication.

and raw-looking during the course of development, the sores and associated inflammation often occur on the back of the foot, on or between the heel bulbs. Lesions sometimes occur on the front of the foot, along the coronary band, and they may occur around the dewclaws. The hind feet are most often affected.

Usually circular or oval in shape, with raised borders, lesions may become granular in appearance or may develop papilla. These hair-like projections are actually outgrowths of skin. Development of lesions is followed by erosion of surrounding skin, likely due to the secretion of enzymes by the infective organism. A progressive infection may also interfere with normal hoof horn growth.

The etiology of digital dermatitis is not clearly understood. Dopfer says *Treponema*-like organisms, and perhaps more than one species of these spiral-shaped bacteria, are

believed to play a key role. It is speculated that other types of bacteria may also be involved.

Dopfer calls the disease multifactorial, emphasizing environmental factors, including warm, wet conditions and abrasive pen or alley surfaces that cause cuts or punctures in the skin between or around an animal's toes. Poor sanitation increases the risk of infection, and nutritional deficiencies can hamper immune system response. There may be a genetic component, too, whereby hoof structure influences a predisposition to infection.

Management under confinement and commingling of cattle are likely contributors to digital dermatitis outbreaks in feedlots. Dopfer says some calves may harbor subclinical lesions at the time of arrival. The feedlot environment may foster the worsening of existing cases and the spread of infection to penmates.

The consequences of digital dermatitis and lameness may include decreased feed intake and lower average daily gain among affected animals, as well as the cost of treatment. There also may be costs associated with

disrupted marketing, since many pen outbreaks occur relatively late in the feeding period and near the time that animals should go to slaughter.

"We have not even begun to estimate the true economic losses caused by digital dermatitis in beef cattle," says Dopfer. "For the time being, an estimated average of \$40 per lesion — even the small ones — is a starting point."

### Treating digital dermatitis

Since attempts to develop efficacious vaccines have been unsuccessful and results of systemic treatment (injectable antibiotics) typically are disappointing, the best bet for managing digital dermatitis is through topical treatments. On dairy operations where digital dermatitis is endemic, walk-through footbaths have been used to apply disinfectant solutions such as copper sulfate or formalin. Disinfectants have also been applied as sprays. These methods have been adopted by some feedlot operations. Results vary, and Dopfer says these products pose

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► An example of digital dermatitis in the M2 stage. If they are unfamiliar with the term "digital dermatitis," some cattle folk may have heard the condition referred to as strawberry foot, raspberry heel or, most commonly, hairy heel warts. They really aren't warts, but the disease results in ulcerative lesions, the appearance of which has been likened to warts.

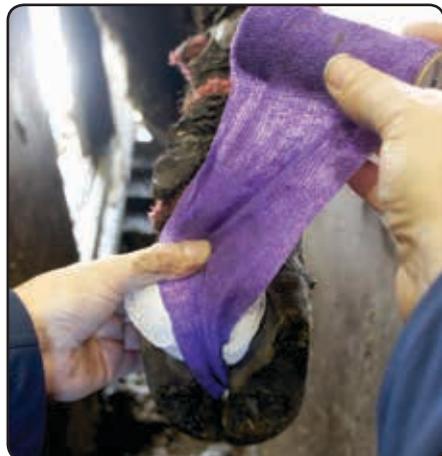
**Table 1: The five M stages of digital dermatitis**

<p>As a result of her team's research of digital dermatitis, University of Wisconsin Veterinary Epidemiologist Dorte Dopfer developed the following classification — five M-stages — describing the progression of disease lesions.</p> <p><b>M0</b> — Normal, healthy skin.</p> <p><b>M1</b> — Small focal circumscribed skin damage at the border of skin and hoof horn. May appear in the interdigital space. Lesions typically less than 2 cm (0.75 inch) in diameter.</p> <p><b>M2</b> — Circumscribed ulcerative lesion with red or grayish surface and may have white epithelial margin. Can be painful to the touch. Commonly found along the coronary band, but may occur around the dewclaws, in wall cracks and occasionally as a sole defect.</p> <p><b>M3</b> — Healing stage, usually occurring one to two days following treatment of M2 lesion with topical antibiotic. Surface typically scab-covered and no longer painful to the touch.</p> <p><b>M4</b> — Chronic stage characterized by thickened epidermis or filamentous proliferative growth commonly called "hairy heel warts."</p> <p><b>M4.1</b> — Chronic stage as described under M4, but with M1 lesion within its perimeter.</p>
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### size measurement, followed by cleaning, trimming around the lesion, treating and wrapping.



Cover lesion with a diaper-like bandage.



Wrap through front and backside.



This bikini-wrap is complete.

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certain risks to the environment and to the health of animals and their handlers.

A labor-intensive but effective alternative is to manually apply a topical antimicrobial and a dressing to affected feet. Dopfer emphasizes that the affected foot should be lifted, thoroughly cleaned and treated with an appropriate product, such as tetracycline, and then wrapped to ensure that the affected area is exposed to the medication for at least 30 minutes. In some cases, hoof trimming may be advisable to address hoof horn malformation caused by the disease.

Control of the disease, rather than a cure, is sometimes the best outcome that can be achieved. Table 1 shows the progression of digital dermatitis through the five “M-stages” as identified by Dopfer. Once the disease advances to the chronic M4 stage, the animal

harbors a reservoir of bacterial disease deep within skin tissues. At the M4.1 or “chronically recurring” stage, animals typically develop lesions repeatedly for the remainder of their lives. As reservoirs of infection, animals in stages M4 and M4.1 are sources of new outbreaks when conditions are favorable.

Dopfer advocates increased awareness of digital dermatitis as a feedlot lameness issue. She and University of Wisconsin colleagues developed “DD Check App” for handheld devices (see [www.zinpro.com/lameness/dairy/dd-check-app](http://www.zinpro.com/lameness/dairy/dd-check-app)), which provides photographs and information about the disease. Originally developed for the dairy industry but applicable to beef cattle, this tool can help feedlot personnel identify and record the incidence of digital dermatitis, predict outbreaks and develop a control strategy.

Sponsored by Zinpro Corp., the app is available at no cost.

Dopfer advises feedlot personnel to always be on the lookout for this disease, learn to recognize it and respond before it progresses too far, emphasizing “chronic digital dermatitis is for life.” Since already-infected calves do arrive at feedlots, cow-calf and stocker operators should also be aware of the disease and its potential consequences.



**Editor's Note:** Troy Smith is a freelance writer and cattleman from Sargent, Neb. Dopfer presented information about digital dermatitis at a feedlot lameness workshop conducted by the Production Animal Consultation group, a science-driven, people-focused group of advisors serving animal protein producers worldwide. Learn more about the group online at [www.pacdvm.com](http://www.pacdvm.com).