

# Dairy Cattle Hoof Health



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<http://dairyhoofhealth.info>

## How to Detect DD in Pregnant Heifers

An article in the February issue of this factsheet series described research demonstrating that pregnant heifers that had multiple digital dermatitis (DD) lesions:

- were 55% as likely to conceive at first service and remained open for an average of 25 extra days;
- produced 334 kg less 305-day milk in first lactation;
- had 5.16 times greater risk of having DD in first lactation.

The authors of that research recommended that a DD control program should be a priority for pregnant heifers.

But before a control program can be implemented, a reliable method of detecting DD in these animals is required. Since their hooves are seldom seen by a hoof trimmer and are typically obscured by bedding, what are the alternatives?

At the 2016 Western Canadian Dairy Seminar, University of Calgary graduate student Casey Jacobs described how she used 'pen walks' to detect DD in pre-calf heifers. The hind feet of 3,026 group-housed animals on 28 Alberta dairy farms were inspected either while they moved freely in their pens or while they were restrained in headlocks. For 292 heifers on 5 farms, the presence or absence of DD lesions detected in this way was compared with hoof inspection in a trim chute (the 'gold standard').

Pen walk detection correctly classified 74% of the heifers that had a DD lesion and 97% of those that did not. Expressed in another way, 85% of the heifers identified in a pen walk as having DD actually had DD lesions when inspected in a trim chute. Conversely, 94% of the heifers diagnosed DD-free had no DD lesions in the trim chute. Fourteen of the 28 farms had no detectable DD in their pre-calf heifers. After adjusting for misdiagnosis, the true prevalence of DD lesions among pre-calf heifers in the other 14 farms ranged from 1% to 17%.

The bottom line: pen walks are reliable enough to be used for the diagnosis of DD in pre-calf heifers, providing a means to initiate DD control in these animals.



## proAction Animal Care Locomotion Scoring

Although the Canadian Dairy Code of Practice advocates the use of the University of BC's 5-point gait scoring system, the proAction Animal Care Farmer Manual (p 39) describes the following method for gait scoring cattle:

1. Establish a suitable location; often the easiest location is the transfer alley between the parlour and the pen.

Criteria for choosing a location:

- ✓ Distance allows observation of cattle walking for four strides (a minimum of two strides);
- ✓ Surface is smooth and flat;
- ✓ Avoid slatted concrete surfaces if possible;
- ✓ Sloped flooring (downward or upward) and areas with steps should be avoided.

2. Gait score sample cattle:

- ✓ Record the identification number of the animal;
- ✓ If cattle have been released from tie-stalls, habituate them by walking them up and down a passageway in a calm manner until they walk in a straight line at a steady pace;
- ✓ Observe at least four strides for each animal and record the presence or absence of a limp on the Cattle Assessment Record. Score 'A' for no limp present and 'U' for an obvious limp.

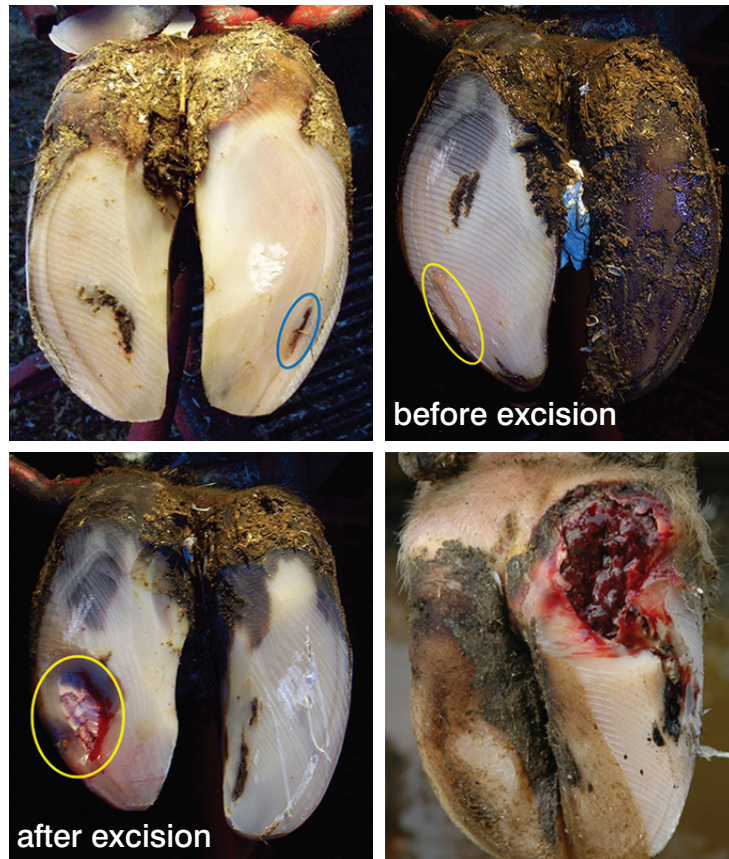
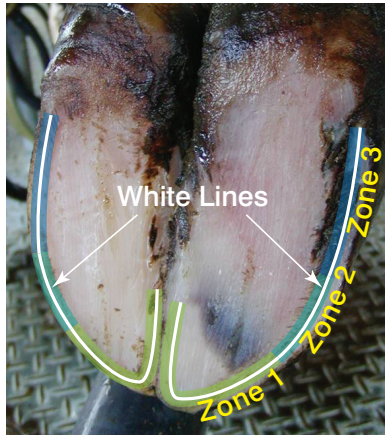
The gait behaviours associated with limping are: favouring one or more limbs. An animal free from injury should bear weight evenly over the four limbs. An animal with an injury may not place all her weight on an affected limb and may walk with an uneven, irregular, jerky or awkward step as if favouring one leg.

## Understand White Line Lesions

After sole ulcers, white line lesions are the most common of the non-infectious hoof lesions found in Alberta dairy herds, accounting for 15.5% of the lesions recorded in The Alberta Dairy Hoof Health Project. White line lesion refers to disintegration of the junction between the outer hoof wall and the sole (the white line) in zones 1, 2 or 3 (shown in the figure on the right), together with any purulent exudate (abscess) due to infection. In a Canadian 3-province study, 62% of these lesions were found on the outside claws of the rear feet; 74% of the lesions occurred in zone 3, 19% in zone 2 and 7% in zone 1.

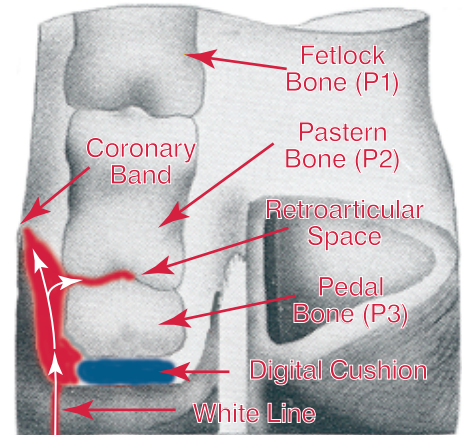
Separation of the white line without complications is often seen at claw trimming. It is only when an abscess develops in this space that the animal will become lame. Although neither lameness nor an abscess may be observed, other evidence of an internal infection may be present:

- Pus may be found oozing from the skin/horn junction on the outer side of the coronary band. If a black mark is observed somewhere in the white line in zone 3, there will be a strong possibility of a track running under the hoof wall from the white line to the coronary band.



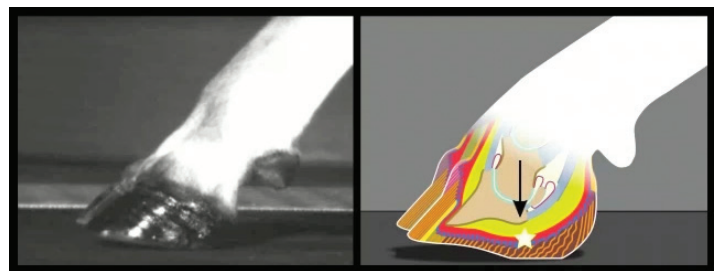
Some typical white line lesions seen after trimming.

- The skin above the coronary band may be tender, puffy and inflamed. This strongly indicates that the pedal-pastern joint is infected. X-ray or ultrasound is usually required to confirm this diagnosis.
- Involvement of the region behind the pedal-pastern joint (retroarticular space) should also be suspected if there is marked tenderness, swelling and skin redness in the area above the coronary band at the heel bulb. This may cause a sudden increase in the severity of lameness. Infection of the pedal-pastern joint itself is more likely to cause swelling of the skin above the coronary band and an increase in the size of the heel bulb.



## Causes of white line lesions

The pedal bone is suspended inside the claw capsule by suspensory ligaments and by interlocking 'fingers' of tissue projecting from the inside of the claw wall (lamellae) and from the connective tissue inside the claw (laminae). The white line is an extension of the lamellae, composed of soft horn tissue joining the wall to the sole. White line lesions are believed to be caused by inflammation of these tissues (laminitis) which, in turn, is usually attributed to ruminal acidosis, although there is little conclusive evidence of this link. It is suggested that laminitis results in sinking of the pedal bone leading to the hemorrhage into the white line that is commonly observed. Relaxation of the suspensory ligaments (e.g., at calving) has also been implicated.



As illustrated in the photo and diagram above, the first impact of each stride is at the heel/sole junction. The digital cushion (fat pad) expands sideways when it is compressed under weight, causing pressure to be exerted on the hoof wall above zone 3. Weakening of the bond between claw wall and sole due to laminitis or disruption of nutrient supply required for new horn formation may increase susceptibility to white line separation. Zone 3 also encompasses the broadest part and the softest and fastest growing horn of all areas of the white line.

Solid foreign bodies may lodge in the softened, widened zone. They can push through to the corium beneath and introduce infection; however, the presence of a foreign body is not essential for a lesion to develop.