

# The latest on lameness treatments for practicing veterinarians

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## Abstract

As a recent graduate, treating lame cows can be a practice growth opportunity that allows you to show your clinical acumen and be a gateway to providing more consultative services as part of a foot health team. To seize this practice growth opportunity, practitioners need to have a clear understanding of the diagnosis and treatment of common foot disorders. Current treatment strategies are not overly complex, however, the majority lack large-scale scientific evidence leading to a variety of opinions and approaches among stakeholders. There are some key principles that should be considered when treating lame cows to reduce pain as soon as possible and to prevent chronicity. These key principles include early and appropriate intervention and appropriate aftercare. Practitioners who seize this opportunity will become a valuable part of a farm's team and greatly improve the welfare of cattle.

**Key words:** lameness, hoof lesions, treatment

## Introduction

Lameness and foot health management has traditionally received very little attention and interest from veterinarians, yet our clients are seeking more involvement from veterinarians.<sup>24</sup> This lack of attention is somewhat surprising as lameness in the dairy industry is a painful, costly disease that affects the productivity of cows through its effect on milk production, culling and reproductive performance.<sup>2,4,9</sup> Similar impacts have been shown for beef cattle.<sup>18</sup> In addition, lameness is also a major animal welfare concern as it is prevalent<sup>13</sup> and highly visible to the consumer. The objective of this paper is to review the treatment for the most common foot lesions. This understanding can then be used by veterinarians as starting point to advocate for appropriate care for lame cows and become more involved in broader services to reduce the impact of lameness in cattle. The information presented in this paper is an update from information presented in previous AABP proceedings.<sup>7,8</sup>

## Digital dermatitis (DD)

### What is it

An infectious and contagious bacterial infection of the skin, commonly seen in the interdigital cleft of the foot.

### How to recognize it

Digital dermatitis presents in a variety of stages ranging from painful, bright red ulcerated, or a less painful, grey/black circular, granulomatous skin lesion. Edges can have a white margin and/or "hairs" protruding from them. Lesions are clearly demarcated and are typically located above in the interdigital cleft but can occur on other locations such as in the interdigital space between the hooves or at the front of the foot. Severe lesions can become proliferative with filamentous projections or hyperkeratotic. It is useful to classify lesions into "active" (painful and

ulcerative lesions > 2 cm) and "chronic" (grey/black hyperkeratotic lesions without painful ulcerative lesions >2 cm).<sup>3,12</sup>

### How to treat it

Currently, no licensed products exist to treat DD in the U.S.<sup>1</sup> Treatment typically consists of applying topical tetracycline-based antibiotics to active lesions using a wrap or a paste.<sup>1,10,11</sup> Other products, including salicylic acid, have been recently evaluated and could be viable alternatives.<sup>5,23</sup> Wraps are not necessary, but if they are used, they should be removed within 24 hours.<sup>11</sup> The use of DD treatment products require an appropriate withdrawal time.<sup>10,23</sup> Non-antibiotic compounds typically containing heavy metals such as copper are also used with varied success.<sup>14,15</sup> The role of topical treatment is to treat an active lesion and hasten its transition to a chronic lesion. Once the lesion is chronic, it is the role of the footbath to prevent recurrence and the goal of treatment should be to reduce pain as fast as possible.<sup>6</sup>

## Foot rot

### What is it

Foot rot should be a sporadic infection of the soft tissues of the foot in dairy and beef cattle. Lameness resulting from foot rot ranges from mild to severe and usually has a sudden onset.

### How to recognize it

Foot rot is recognized by the sudden onset of lameness accompanied by the symmetrical swelling of the lower leg above the hoof. Depending on the stage of the disease, the interdigital skin splits open and putrid, foul-smelling discharge is noticeable. In more severe cases, loose pieces of necrotic tissue can be easily removed from the interdigital space.<sup>21</sup>

### How to treat it

Foot rot should be treated with systemic antibiotics according to label directions with a variety of products being licensed.<sup>1</sup> There is typically no need to remove necrotic tissue or apply bandages. Treated animals should visually improve within 2-3 days. If animals do not respond, the diagnosis should be re-evaluated. In severe cases, the infection can spread to tendons and joints resulting in a very severe lameness that is unresponsive to regular systemic antibiotic treatment.<sup>21</sup>

## Sole ulcers

### What is it

Sole ulcers typically occur beneath the flexor tuberosity P3 (third phalanx) of the outside hoof in rear legs and are associated with varying degrees of changes in weight bearing.<sup>19</sup>

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## How to recognize it

Sole ulcers are recognized by the presence of severe hemorrhage or protrusion of the corium at the typical sole ulcer site.<sup>19</sup> Severe hemorrhages with an associated pain withdrawal reflex upon pressure with hoof testers should be considered early sole ulcers and treated accordingly.

## How to treat it

Sole ulceration results in chronic changes and is a painful condition.<sup>16</sup> Appropriate early treatment is critical to successful resolution of symptoms and to minimize the impact of long term changes.<sup>19,20</sup> The treatment of sole ulcers involves the removal of all loose horn around the corium. This removal should occur delicately with great care taken to minimize further damage to the corium.<sup>17</sup> Once loose horn has been removed around the lesion, pressure on the lesion should be reduced to maximize the speed of horn growth. The reduction of pressure on the lesion is achieved by the removal of horn around the lesion and by application of a properly sized hoof block to transfer weight to the sound hoof.<sup>17</sup> Cows with sole ulcers should be rechecked in 3-6 weeks to assess healing, and to either remove or reposition the block if necessary. Although currently not licensed in the U.S., the use of an NSAID in early sole ulcer cases should be considered to counteract the inflammatory changes.<sup>19,22</sup>

## White line disease

### What is it

White line disease encompasses a range of lesions that typically occur in the abaxial white line region toward the heel on outside hoof of the rear foot.

### How to recognize it

White line lesions can range from hemorrhages to separations and abscesses. Lamé cows typically present with areas of white line separation that are painful when tested with hoof testers or areas of more extensive hoof wall separation that can extend up to the coronary band. The presence of an abscess is variable as the pressure it creates can either have drained prior to inspection or be discovered when following a painful separation. Typical location of white line lesions is in the abaxial white line of the heel area of outside hooves in rear feet, but similar type lesions can be found at different white line regions of the hoof and should be treated similarly.

### How to treat it

White line disease can appear to be a very acute and painful condition, however, there are gradients of white line lesions and appropriate early treatment is critical to successful resolution. Like sole ulcers, the treatment of painful white line lesions involves the removal of all loose horn around the lesion including the wall. This removal should occur delicately with great care taken to minimize further damage to the corium. Once loose horn has been removed around the lesion, pressure on the lesion should be reduced by thinning the lesion margins and lowering the heel to maximize the speed of horn growth. The use of hoof blocks, rechecks and anti-inflammatories is like the treatments described for sole ulcer ulcers.

## Thin soles

### What Is It

Thin sole lesions occur when the sole horn has worn away enough that the sole flexes with digital pressure, but the corium is not exposed.

### How to recognize it

In adult animals, a thin sole should be suspected when the dorsal wall length is less than 7.5 cm (3 inches). Upon pressure with a finger or hoof tester/knife, the sole will feel flexible and soft. In more severe cases, there will be a withdrawal response with hoof testers. Typically, the white line areas will appear the thinnest and the corium will appear to bulge at this location. Cows affected with thin soles can have multiple hooves affected and walk in a characteristically tender manner.

### How to treat it

The goal of thin sole treatment is to prevent further wear of the sole and exposure of the corium. This is accomplished by the placement of a thin hoof block on the affected hoof. This thin block prevents further abrasion and allows the affected hoof to grow more horn. Additional treatment strategies include the reduction of the walking distance of affected cows and the provision of a deep-bedded lying area for recovery. Cows with thin soles should be rechecked in 4-6 weeks to remove the block.

## Corkscrews

### What is it

Corkscrews are a structural abnormality of the phalanges that occur in both beef and dairy cattle. Historically, it occurred on lateral hind hooves of older animals. However, recently in both the dairy and beef industry, corkscrews have been reported in medial hooves of the front and back feet of younger animals.

### How to recognize it

Lameness associated with corkscrews is variable and depends on the size of the animal, extent of the hoof rotation and abrasiveness of the walking surfaces. Upon hoof evaluation, the affected hoof will appear longer and narrower with an inward and upward spiral rotation creating a “corkscrew” appearance. When evaluating the sole of a corkscrew, there will typically be excessive growth under the flexor tuberosity and curling over of the abaxial wall if the animal is not walking in an abrasive environment. If the animal is housed in an abrasive environment, the affected hoof will likely be larger with hemorrhaging at the white line near the toe and the opposite hoof is likely to have a thin sole.

### How to treat it

Treatment of corkscrew focuses on managing the external changes that occur on the hoof, as the internal changes are permanent. To prevent lameness, animals with corkscrew should be trimmed every 3 months to remove the excessive growth that occurs under the flexor tuberosity and avoid excessive force on the hoof. Key components of treatment include excessive modeling of the sole to counteract for the excessive growth under the flexor tuberosity and avoiding excessive reduction of the sole thickness of the affected hoof. Excessive horn growth on the dorsal wall can be removed, but excessive horn on the axial wall should be left in place to ensure the stability of a narrower P3.

# Deep digital sepsis

## What is it

Deep digital sepsis is an infection of the foot which involves the deeper structures, typically including the distal interphalangeal joint and flexor tendons. Deep sepsis can be an infrequent sequela to lesions such as foot rot, sole ulcers or white line disease.

## How to recognize it

Deep digital sepsis is recognized by the presence of asymmetrical swelling of the distal limb and foot, with most of the swelling located on the abaxial side of the affected hoof. In most cases, the swelling includes the coronary band. The cow will be extremely lame and non-weight bearing. If the deep flexor tendon and tendon sheath are involved, the swelling can extend to or above the dewclaws.

## How to treat it

Deep digital sepsis is an extremely painful condition and requires immediate appropriate intervention to address the pain. Conservative treatment using solely antibiotics, hoof blocks and therapeutic trimming is not sufficient nor appropriate in these cases. Treatment options for deep digital sepsis include surgery (arthrodesis or amputation), and in some cases, euthanasia may be the most humane course of action. Culling of animals with deep digital sepsis for salvage is not appropriate due to the high risk of these animals becoming downer animals. Various surgical approaches exist to treat these lesions, and the choice of technique should include animal- and herd-level factors such as age, value, productivity, stage of gestation, footing and ability to provide post-operative care. Generally, amputation results in a shorter productive life, but has a quicker recovery period than other treatment options.

## Conclusion

Due to the chronic nature of most foot lesions, early diagnosis of lameness is paramount. With appropriate interventions as described in this paper the number of cows that become chronically affected, or even worse get deep sepsis, will be greatly reduced. To accomplish this the treatment of digital dermatitis and foot rot requires the judicious use of antibiotics and appropriate withdrawals. Treatment of sole ulcers and white line lesions require the removal of loose horn, application of a hoof block and appropriate after-care including scheduled recheck. In cows with horn lesions, the use of anti-inflammatory and pain-relieving drugs should be considered, especially when they are not chronic in nature. Other, less frequent lesions like thin soles and cork-screw can be more challenging to treat, but with appropriate interventions including thin blocks and regular hoof trimming, the animal's welfare can be improved. With the increased skills in the treatment of lameness cases, veterinarians will develop the credibility to become more actively involved in foot health management and communicate with other stakeholders.

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