



Cattle Producer's Handbook

Animal Health Section

639

Foot Rot of Cattle

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Foot rot of cattle (infectious pododermatitis) is characterized by acute or chronic necrotic inflammation of tissues between the claws of the feet. It is the major cause of lameness in cattle.

Cause

Foot rot is an infection of the soft tissue between the claws (digits) of the feet and is caused by two anaerobic bacteria (these are bacteria that grow in the absence of oxygen)—*Fusobacterium necrophorum* and *Bacteroides melaninogenicus*. These bacteria are common in the environment and *F. necrophorum* is present in the rumen and feces of normal cattle. Once these bacteria invade the skin of the foot, they rapidly cause the condition recognized as foot rot.

Injury or damage to the skin between the claws allows this invasion to occur. Common factors that can cause damage of this sort include:

- Stubble fields
- Small rocks and pebbles
- Abrasive surfaces

Additionally, high temperatures and excess moisture or humidity cause the skin between the claws to chap and crack allowing these bacteria to invade. With wet winters and springs, the advent of hot weather provides the ideal conditions for foot rot to become a major problem in the summer.

Signs and Epidemiology

The appearance of foot rot is fairly typical and begins as a swelling of the skin between the claws. This swelling usually begins within 24 hours of the onset of the infection. The toes become separated due to the swelling and the skin appears reddened. The foot is very painful, and the animal can be quite lame at this time.

A fissure or crack develops along the swollen area for part or all of the length of the affected interdigital space. Yellow to grayish tissue extends from this crack, and the lesion has a characteristic foul odor. The area around the coronary band can be swollen and red.

Affected cattle can have a mild fever, refuse feed, lose weight, and be mildly to severely lame. Also, it is common for affected cattle to lose a considerable amount of weight during a bout with foot rot.

If the foot rot lesion does not heal satisfactorily, serious problems can develop. The structures just beneath the skin of the foot include the bones of the foot, the tendons, and joint of the foot. If these underlying structures are invaded by bacteria (particularly the joints, bone, or tendons) therapy is difficult and the chances of recovery are much lower.

Foot rot can usually be recognized in typical cases, however, several conditions can be confused with foot rot, which include:

- Corns
- Puncture wounds due to nails
- Needles or other sharp objects
- Sole abscesses
- Fractures of the bones of the foot

All lame feet should be carefully examined, and it should not be assumed that all lame cattle have foot rot. If you have any questions regarding the condition affecting your cattle, you should contact your veterinarian for diagnosis and advice.

Feet infected with *F. necrophorum* serve as the source of infection for other cattle by contaminating the environment. Disagreement exists on the length of time *F. necrophorum* can survive off of the animal, but estimates range from 1 to 10 months. Once loss of skin integrity

occurs, bacteria gain entrance into subcutaneous tissues and begin rapid multiplication and production of toxins that stimulate further bacterial multiplication and penetration of infection into the deeper structures of the foot.

“Super foot rot,” seen in some areas of the country, has received this name due to the rapid progression of symptoms, severity of tissue damage, and lack of response to standard treatments. There is reported response to ceftiofur sodium as an effective treatment. Ceftiofur sodium is a prescription drug restricted to use by or on the order of a licensed veterinarian. The standard footbaths have not been effective in preventing super foot rot.

Treatment

Treatment of foot rot is usually successful, **especially when instituted early in the disease course**. It is advisable to separate and isolate cattle exhibiting signs of foot rot. Treatment should always begin with cleaning and examining the foot to establish that lameness is actually due to foot rot. Topical treatment may aid in resolution of clinical signs and help prevent spread of the disease. The benefit is most likely from keeping the feet clean and isolation of the affected animal.

If instituted, topical treatment consists of cleaning necrotic debris from the lesion, possibly followed by topical therapy of antibiotic ointment or powder labeled for external use or an astringent such as copper sulfate. If bandages are used they must be changed frequently to allow drainage of necrotic remains. Some very mild cases will respond to topical therapy only. Most cases require the use of systemic antimicrobial therapy.

Various non-prescription antimicrobial products are approved for the treatment of foot rot. It is important to read and follow label directions to avoid residues in meat and milk and to assure an appropriate response to treatment. Failure to adhere to the approved dosage level and treatment schedule may constitute extra label drug use and must be prescribed by the attending veterinarian. The attending veterinarian may choose to make use of a prescription antimicrobial agent. Your veterinarian may deem it necessary to use or oversee the use of one of these restricted drugs as a treatment for non-responding cases. It is important that the producer and veterinarian take all appropriate measures to avoid residues in meat and milk and to minimize injection site tissue damage.

If at all possible, affected animals should be kept in dry areas until healing has occurred. If improvement is not evident within 3 or 4 days it may mean the infection has invaded the deeper tissues. Infections that do not respond to initial treatments need to be re-evaluated by your veterinarian in a timely manner. He or she will want to determine if re-cleaning, removing all infected tissue, application of a topical antimicrobial, and bandaging are appropriate along with an antimicrobial change.

In the more severe cases, disposition of the animal will be between salvaging for slaughter (following drug with-

drawal times), claw amputation, or in valuable animals, claw salvaging surgical procedures. Your veterinarian will be able to provide you with information you may need in making this decision.

Prevention

Preventive measures are centered on the prevention of mechanical damage to the foot as caused by frozen or dried mud, brush hogged weeds or brush and stubble, and minimizing time cattle must spend standing in wet areas. Other preventive measures presently used include the use of footbaths (most often used in confinement beef or dairy operations), addition of zinc to the feed or mineral mixes, and/or vaccination.

Footbaths

10% zinc sulfate solution, 16 pounds per 20 gallons water, treat 1 or 2 times weekly

10% copper sulfate solution, 16 pounds per 20 gallons water, treat 1 or 2 times weekly

Low level feeding of chlortetracycline (CTC) is labeled, through the U.S. Food and Drug Administration, for beef cattle for the reduction of liver abscesses at 70 mg/head/day. *F. necrophorum* is the major infective agent in liver abscesses and foot rot in cattle. CTC is labeled at 350 mg/head/day (at least 0.5 mg/lb/day) in beef cattle under 700 pounds, and 0.5 mg/lb/day in cattle over 700 pounds for the prevention of anaplasmosis. Consequently, many mineral mixes and commercial supplements are formulated to provide 350 mg/head/day to control those diseases listed on the label.

Since the same organism that causes foot rot also causes liver abscesses, veterinarians, nutritional consultants, and producers often assume that some control of foot rot should occur at the 350 mg/head/day dose level. **However, CTC is not labeled for the control or prevention of foot rot, and extra label drug use is not allowed in mineral or feed preparations.** In addition, cattle producers in endemic anaplasmosis areas should be aware that feeding cattle chlortetracycline at the label level can clear cattle of the anaplasmosis carrier state and, if not re-infected within 1 or 2 years, they would become susceptible to clinical anaplasmosis.

The addition of ethylenediamine dihydroiodide (0.156%) in an ad libitum-fed salt mineral mix has been used widely to prevent foot rot in cattle, and its efficacy has been shown in experimental infections. Cattle must be observed for tolerance, however, because of the variation in susceptibility to iodides. Producers should be aware that the only label indication for EDDI is for use as a nutritional source of iodine in cattle.

When cattle are moderately to severely deficient in dietary zinc, supplemental zinc may reduce the incidence of foot rot. Zinc is important in maintaining skin and hoof integrity and, therefore, adequate dietary zinc should be provided to help minimize foot rot and other types of

lameness. Oral zinc has been used both for prevention and treatment with good results. The Nutrient Requirements of Beef Cattle publication recommends that cattle should receive 30 parts per million of available zinc daily.

Two commercial vaccines are approved for use in cattle as a control for foot rot—Volar, Bayer Corporation, and Fusogard, ImmTech Biologics. Both products require two injections 21 days apart. Vaccines are intended to prevent disease and must be administered before a *F. necrophorum* challenge. Consult with your veterinarian regarding use of any vaccine.

Summary

- Foot rot is one of many conditions of the foot that cause lameness in cattle.
- For treatment to be effective it must be started early in the course of the disease.
- It is necessary to have a break in skin integrity for foot rot to occur.
- The most important preventive measures are centered on the insurance of interdigital skin health.

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