

Question: I've rarely had footrot in my cows until this summer. What causes footrot? How do I best treat it and prevent it?

Answer: Footrot, classically called interdigital necrobacillosis or interdigital phlegmon is one of several causes of bovine lameness which can range from mild to severe and from acute to chronic. It is the result of infection of the soft tissue between the claws (digits) of the foot generally associated with bacteria of the genera *Fusobacterium* and *Bacteroides*. These organisms are ubiquitous in the environment and the former is a normal inhabitant of the rumen and feces of cows. They are toxin producing agents such that once they invade the skin they progress rapidly and cause tissue death (necrosis). Other bacteria or fungi may be secondary invaders which complicate our diagnostic and treatment efforts.

Clinical signs of footrot include lameness and swelling which begins in the interdigital space and progresses rapidly toward the dewclaws and above. The tissues appear reddened. Fever and loss of appetite may occur. On examination a crack or fissure is usually present between the toes along with devitalized tissue and foul odor. If the infection progresses to critical structures of the foot including bone, tendon, or joint, treatment becomes very difficult and prognosis for recovery declines from very good to poor.

It is generally believed that healthy intact skin is resistant to bacterial invasion. Footrot is thus predisposed by conditions that cause breaks in the skin, irritation, erosion, abrasion, thinning, or cracking. Continuous exposure to wet mud and or manure is most commonly associated with an increase in incidence of foot rot. Such was the case this past summer in most of Vermont. Other causes include sharp stone, stubble, and frozen or dried mud. Footrot can occur sporadically within a herd or as an outbreak, may be a persistent problem on some farms while others have none and sometimes only affects a specific group of cows in the same herd. This suggests that there are other predisposing factors which remain poorly understood. It is speculated that some soils may support the growth and spread of bacteria more than others, there may be variations in the pathogenicity of different bacterial populations and the role played by secondary invaders, and susceptibility of cattle may be influenced by immune status, nutrition, or genetics. Diets deficient in copper, selenium, and zinc are believed to increase the risk of footrot.

Treatment of any lameness should always begin with a thorough examination of the foot which includes cleaning and trimming of both claws. In a herd outbreak this may not be practical and without restraint facilities may not be possible. Footrot must be differentiated from other causes of lameness including penetrating or strangulating foreign bodies, ulcers, abscesses, and fractures. All devitalized tissue should be surgically removed and the cow should remain in a clean, dry environment until healed. Treatment recommendations vary according to severity of condition. A clean holding pen alone, topical antiseptics or bandaging the foot with astringents may be adequate in mild cases. Be aware that foot wraps are only effective for a few days and should be removed or replaced accordingly. Bandages left in place too long can impede healing and cause further damage. When there is swelling of the soft tissues, I believe that systemic antibacterials are necessary which might include those of the sulfonamide, tetracycline, or penicillin families. If infection has invaded deep tissues, routine soaking

of the foot in saturated epsom salt solutions is very beneficial although difficult. In most cases, success is directly correlated with the timeliness of intervention and proper choice of treatment. When large numbers of cattle are affected, antibiotics may be administered via the feed or water and/or cows may be walked through antiseptic footbaths, wet or dry, twice daily for several days. Copper sulfate and hydrated lime are most commonly used for this purpose. Consult with your veterinarian for specific treatment recommendations. Remember that all injections should be given in the neck, and be aware of proper dosing regimens and withholding times.

Prevention of footrot begins with minimizing any conditions that can injure, abrade or irritate the soft tissues of the foot. Limit exposure to wet, muddy areas commonly found around feed bunks and water troughs, laneways, shaded areas where cattle congregate, and overcrowded paddocks. Coarse gravel or sharp stone should be top dressed with sand or screenings to prevent injury. Avoid pasturing cattle on recently mowed areas where coarse stubble remains. Good nutrition and supplementation with zinc, copper, selenium, and vitamins maybe beneficial. Where facilities permit, periodic footbaths can effectively reduce the incidence of new infections. Other preventive measures used include feeding low level antibiotics, and vaccination. It is my opinion that these approaches are of limited value and should be considered as a last resort. From a medical perspective, feeding sub-therapeutic levels of antibiotics remains controversial.