

FOOTROT IN CATTLE

A common condition that often necessitates the use of antibiotics in cattle is "footrot" or what is medically termed **interdigital phlegmon**. It 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. *Fusobacterium necrophorum* is the same agent that causes liver abscesses in dairy cattle and feedlot calves. Once these bacteria invade the skin of the foot, they rapidly cause the condition we recognize as footrot. 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, and abrasive surfaces. Additionally, high temperatures and excess moisture or humidity causes the skin between the claws to chap and crack allowing these bacteria to invade. The wet spring this year, the lush pastures in many areas, and the advent of hot weather may provide the ideal conditions for footrot to become a major problem this summer.

The appearance of footrot is fairly typical and begins as a swelling of the skin between the claws. This swelling usually occurs 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 space between the toes (the interdigital space). Yellow to grayish tissue extends from this crack and the lesion has a characteristic foul odor. The British call this disease "foul of foot" which is very descriptive. The area around the coronary band can be swollen and red. Affected cattle can have a mild fever, refuse feed, and be mildly to severely lame. Also, it is common for affected cattle to lose a considerable amount of weight during a bout of footrot. If the footrot lesion does not heal satisfactorily, very serious problems can develop. The structures just beneath the skin of the foot include the bones of the foot, the tendons and joints of the foot. If these underlying structures are invaded by bacteria-particularly the joints, bones, or tendons--therapy is very difficult and the chances of recovery are low.

Footrot can usually be recognized in typical cases; however, a number of conditions can be confused with footrot. These conditions include corns, puncture wounds due to nails, needles, or other sharp objects, sole abscesses, fractures of the bones of the foot, and a newly recognized condition that primarily affects dairy cattle, "hairy foot warts." All lame feet should be carefully examined and it **should not** be assumed that all lame cattle have footrot. If you have any questions regarding lameness problems affecting your cattle, you should contact your veterinarian for diagnosis and advice.

Treatment of footrot is relatively straightforward and if instituted early is usually successful. For mild cases, local treatment can be accomplished by thoroughly cleaning the foot, and then applying an astringent (such as 5% copper sulfate). For moderate or severe cases, systemic antibiotic therapy is usually recommended. Antibiotics that are usually effective include penicillin, oxytetracycline, ampicillin, or sulfa drugs. All label directions should be carefully followed including withdrawal times before slaughter. If a

dose higher than that listed on the label is used, the antibiotic is being used in an extra-label manner and a veterinarian's prescription is needed and an extended withdrawal time determined by your veterinarian must be observed. Also, if the drug is not approved for treatment of footrot, a prescription is needed. If the animal does not improve (with noticeably less lameness) within a day or two or if deeper structures of the foot become infected, consult your veterinarian immediately.

One preventive measure is to insure that damage to the feet of cattle is minimized. This includes making sure cattle do not have to be in muddy areas for extended periods of time. Limiting coarse stubble grazing to cooler times of the year and limiting contact with gravelly or rocky areas. Some of these problems may not be avoidable under practical conditions. Other preventive measures that have been recommended include footbaths, feeding of organic iodine, feeding of zinc methionine, and/or vaccines. Footbaths can be used to prevent cases; however, they are not particularly useful in the face of an outbreak. The common footbath solutions are (1) 2% formalin, and (2) 5% copper sulfate. Both compounds must be used with extreme caution from both animal health and environmental aspects. In fact, formalin solutions are very caustic and will damage your skin or eyes if splashed or spilled and are not generally recommended except in the face of extreme problems. Copper sulfate can be fatal to cattle if they drink it and must be disposed of carefully to avoid damaging aquatic plants or animals. Footbaths should be used 3 times per week to be effective and should not be used for long periods of time (greater than 3 weeks). The cattle should have clean feet before entering the foot baths (pre-washing may be necessary) and only about 300 head can be done before the solution should be changed. Feeding organic iodine (ethylenediamine dihydriodide; EDDI) can help prevent footrot. The EDDI should be fed at 10-15 milligrams per head per day. Feeding more than this will not be any more effective and can cause the cattle to have excess salivation. EDDI fed in loose salt mixes works very well. EDDI **should not** be fed in salt block formulations as it does not seem to be available to the cattle. Zinc methionine (Zinpro®) is also thought to be helpful in preventing footrot in feedlot situations and might be of value in range or pasture situations. There are commercial vaccines that have limited effectiveness in preventing footrot in cattle; it is important to strategically administer these vaccines so that maximum protection is achieved during the time of year when cattle are most at risk (summer). Your veterinarian will also know of local factors that may be important in preventing footrot, so be sure to discuss this matter with him/her before spending a lot of time, money or effort on control and prevention measures. Since footrot is an infectious disease it is important that your cattle's immunity is normal and thus a good feeding and supplementation program is necessary. We see many more footrot problems in beef herds that are copper deficient or selenium deficient. So make sure your cattle are not short on either of these trace minerals. The key to managing footrot is prevention, because treating a large number of individual animals can take a lot of the fun out of summer.

John Maas, DVM, MS
Diplomate, ACVN & ACVIM
Extension Veterinarian
School of Veterinary Medicine
University of California-Davis