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D. L. HAGGARD and J. O. HANSON

# Footrot of Cattle

Footrot 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.

## CAUSATIVE FACTORS

The bacterial organism *Fusiformis necrophorus* (*Sphaerophorus necrophorus*) is the only organism recovered consistently from the lesion of footrot. Discharges from the feet of infected animals are the probable source of infection. Duration of infectivity of pasture or bedding is unknown.

## PREDISPOSING FACTORS

Bacteria gain entrance through lesions on the lower part of the foot; the bacteria do not penetrate normal skin. Anything that can damage the skin between the claws should be considered as predisposing to the disease. Wet manure and mud can soften the skin between the claws and permit infection. Dried or frozen mud, stones, and stubble can bruise the tissues sufficiently to lower their resistance to disease. Also, the anatomical structure of the cloven hoof predisposes to injury by permitting small stones and other objects to lodge between the hooves.

## OCCURRENCE

Footrot occurs in cattle of all ages, but it is most common in adults. The disease is seen year-round, but there is increased incidence in the wet summer and fall months.

## MORBIDITY AND MORTALITY

As much as 25 percent of a herd may be affected at one time, but morbidity is variable, depending on conditions. Usually the disease occurs sporadically on affected farms. Footrot usually does not cause death of the animal, but severely affected animals may have to be slaughtered because of joint involvement.

## LOSSES

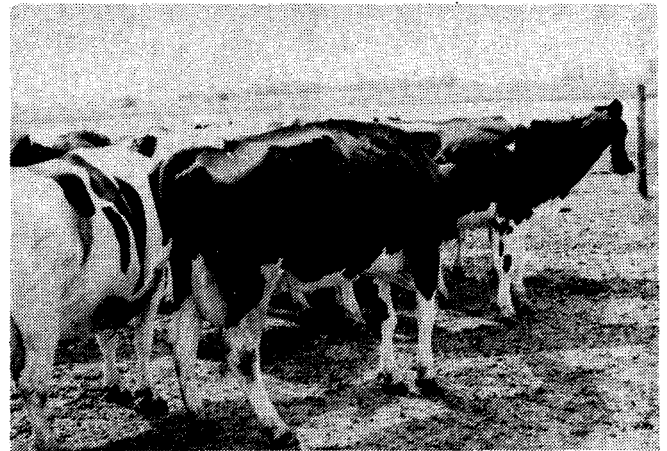
Economic losses are caused by reduction of milk production in dairy cattle, weight loss or decreased rate of gain in beef cattle, and decreased breeding efficiency in both male and female cattle. Loss of income results when affected cattle have to be slaughtered.

## CLINICAL SIGNS

Lameness appears suddenly; usually only one foot is affected. An animal will put little weight on the affected leg, but will place weight on the limb while walking or running. A moderate fever (103°-104°F.) may accompany the early signs. Milk cows will have a temporary depression of production, and affected bulls may not breed during this time. A loss of flesh will occur in a few days because of decreased feed consumption.

The typical early lesion is a break in the skin between the claws. Pus may be present, but not in large amounts. Edges of the break are covered with necrotic material, and the lesion has a characteristic foul odor. The foot is swollen and the animal is in acute pain.

Spontaneous recovery may occur, but if the animal is not treated, the lameness may persist for several weeks. The incidence of complications such as involvement of the tendon sheath and joints, causing an infectious arthritis, is greater in untreated cases. In such cases the swelling is more severe and extends up the back of the leg. The animal will be in extreme pain and will carry the leg.



Holstein cow affected with footrot showing lameness of the right forelimb.

## DIAGNOSIS

A physical examination of the animal to determine the cause of the lameness will reveal a characteristic break in the skin located between the claws of the foot and the characteristic foul odor of the lesion. The season, climate, and occurrence of the disease in the herd also aid in indicating the diagnosis of footrot. Bacterial culture usually is not necessary for diagnosis, but a culture will reveal *F. necrophorus*.

Traumatic injury, sole puncture, sole abrasion, bruised heels, and stable footrot should be considered in a differential diagnosis. Another problem is wire or bailing twine that has become wrapped around the hoof, causing extreme swelling and tenderness with clinical symptoms similar to footrot. All of these conditions usually can be distinguished by careful examination of the foot.



Early lesion of footrot. Note the skin break between the claws.



A case of infectious arthritis that occurred in an untreated footrot infection. Severe swelling extends farther up the leg. Amputation of the affected claw is occasionally required to provide drainage and healing.

### TREATMENT

Best results are obtained by early local treatment of the foot lesion and parenteral administration of antibiotics or sulfonamides. Local treatment includes scrubbing the foot, curetting away all necrotic tissue, trimming the hoof if

necessary, applying an antibacterial dressing, and bandaging. Penicillin, tetracyclines, sodium sulfadimidine, sulfabromomethazine, and other antibacterial agents are used for systemic therapy. Daily treatment begun immediately after onset of lameness usually will give excellent recovery in two to four days. Treated animals should be maintained on a dry surface until recovered.

In cases with involvement of deeper tissues, surgical drainage may be necessary. Severe arthritis resulting from joint involvement may make it necessary to amputate the affected claw.

### CONTROL

Prevention of foot injury is the first item to consider in decreasing the occurrence of footrot in a cattle herd. Remove the cattle from stubble fields and other areas where injury is likely to occur. Drain or fill in muddy or stony areas in cattle lots and lanes.

Foot baths can be used to assist the removal of irritant materials, harden the hoof, and decrease the susceptibility to infection. The animals should be made to pass through the baths once or twice a week, depending on the need. The chute should be at least 10 feet long and 2-3 feet wide, depending on the size of the animals. The depth of the liquid should be about 6 inches, and the bath should have a roof to prevent dilution of the chemical by rain. The bath may operate as a wet bath in the summer and a dry bath in the winter.

Wet bath solutions are astringent; for example, a 2-5 percent formalin (1 gallon formalin to 20-50 gallons of water) or a 5 percent copper sulfate (10 pounds copper sulfate to 25 gallons of water).

A mixture of 1 part copper sulfate to 9 parts slaked lime is a popular mixture for a dry bath. (Dry baths rapidly become contaminated under wet conditions.) Animals should not be exposed to the chemicals for prolonged periods since they may be irritating or may harden the hoof excessively.

Feeding of chlortetracycline to feedlot cattle (500 mg per day per head for 28 days, followed by 75 mg per day throughout the fattening period) also reduces the incidence of footrot considerably. Care should be taken to observe the withholding period carefully before slaughter of cattle being fed antibiotics.

Organic iodides such as ethylenediamine dihydroiodide (EDDI) have been used as feed additives for the prevention and treatment of footrot (50 mg per head per day for prevention and 100-400 mg per head per day for treatment). Recent investigations, however, indicate that continuous feeding of iodides may not significantly decrease the occurrence of footrot and may cause respiratory embarrassment plus other health problems associated with iodism. Therefore, the feeding of organic iodides for extended periods of time should be avoided.

Recent research has shown that dietary zinc supplementation is effective in treating and preventing footrot in cattle. Zinc such as zinc sulfate (1.8-3.2 mg per pound per day) and an organic compound, zinc-methionine complex (4.5 gm per head per day), have been used for this purpose. Zinc in the form of zinc-methionine has a much higher absorption rate from the digestive tract than other forms of zinc.

