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BEEF CATTLE RESEARCH COUNCIL

# RESEARCH FACTS

RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY



## Prevalence of Toe Tip Necrosis

Project Title:

Investigating P3 Necrosis in Feedlot Cattle

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Project Code:

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### **Published:**

- The lesions of toe tip necrosis in southern Alberta feedlot cattle provide insight into the pathogenesis of the disease; Canadian Veterinary Journal 56:11
- Epidemiology of toe tip necrosis syndrome (TTNS) of North American feedlot cattle; Canadian Veterinary Journal 57:829
- Prospective case-control study of toe tip necrosis syndrome (TTNS) in western Canadian feedlot cattle; Canadian Veterinary Journal 58:247

### **Background:**

Lameness is the second most costly feedlot health issue after bovine respiratory disease. In addition to treatment and death losses, lame cattle eat less, grow less, convert feed to gain less efficiently, and are more prone to transport injuries. Lameness is also a significant animal welfare concern and has been incorporated into some on-farm welfare audit systems.

There are many different types and causes of lameness, ranging from genetics (e.g. conformation), nutrition (e.g. founder), the environment (e.g. frostbite), and injuries and infection (e.g. footrot, hairy heel wart). Some may have several causes, like toe tip necrosis syndrome (TTNS).

TTNS is a specific type of lameness that affects the outside claw of the hindfoot, and typically occurs within one to seven days after arriving at the feedlot. The coronary band at the top of the hoof splits, and the hoof wall often sloughs off after two to four weeks.

## Objectives:

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To describe the epidemiology of TTNS at the level of the individual animal, the pen, and the feedyard.

## What they did:

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The database for Feedlot Health Management Services (FHMS) was reviewed for confirmed fatal cases of TTNS reported between January 1, 2008 and December 31, 2012. TTNS was defined as necrosis (death) of the tip of the toe, along with infection of the P3 bone at the time of post-mortem examination.

## What they learned:

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TTNS occurred sporadically, but clustered at the pen and feedyard level. Outbreaks were also found to occur at feedlots that had previously reported low numbers suggesting that risk factors for the disease may be associated with incoming cattle. That being said, around 25% of all affected pens were in one feed yard which suggests that there may be risk factors present at the feedyard as well.

TTNS was found most often in the early stages of the feeding period. Around 50% of TTNS treatments occurred at 12 or fewer days on feed. This means that animals were exposed to risk factors for TTNS before, on the day of, or within a few days of feedlot arrival.

Most TTNS cases were auction mart derived cattle and cases were split evenly between yearlings and calves. More steers were found to have TTNS than heifers but these numbers are most likely due to the fact that auction mart derived steers are the most common type of cattle fed and not necessarily that they have a higher risk of TTNS.

Of the animals given antibiotics for TTNS, 25% died within 6 days of treatment. Seventy percent of animals diagnosed with TTNS post-mortem were not treated with antibiotics, suggesting that the disease responds poorly to antibiotics or that the disease is hard to diagnose and therefore treatment is given too late or not at all.

The number of TTNS cases declined each year over the course of the study, suggesting a better understanding of the disease and how to treat it.

## What it means:

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The 'abrasion theory' is that TTNS is caused due to damage to the sole of the foot which results in white line separation and subsequent infection. The results of this study fit with this theory. Since infected cattle were shown to cluster by pen, standing or handling cattle on concrete while sorting, on the farm, at auction markets, or trailer flooring during transport are likely a risk factor for TTNS.

Clustering by feedyards suggests that there are feedlot specific factors such as facility design, flooring, animal handling, and the ability of staff to identify and treat cases.

This research has provided a greater understanding of TTNS and how to prevent it.

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