Eating dirt, and fatal ulcers in baby calves ...

# What's the Connection?

by Troy Smith

Frequent observation of baby calves licking dirt makes the conscientious cowman wonder what causes that kind of behavior and raises concern over potential ill effects. When calves that have been seen eating dirt later die from perforated ulcers, cowboy logic suggests that the events may be connected.

While many producers are convinced that the ingestion of dirt or sand increases chances that calves will develop ulcers within the abomasum (second stomach), veterinarians say that conclusion is speculative. In fact, there is much speculation involved with any discussion of factors affecting the incidence of abomasal ulcers and reasons why calves eat dirt.

PHOTO BY TROY SMITH

►While it seems like there might be a connection, there is no scientific evidence that calves' eating of dirt leads to ulcers, says Nebraska veterinarian Russ Rice of Broken Bow. While not ruling it out, he suggests multiple disease-causing factors can be involved.

"Producers want answers in black and white, but the situation isn't clear cut," says Nebraska veterinarian Russ Rice of Broken Bow. "While it seems like there might be a connection between calves licking dirt and development of disease, there is no proof. There is no scientific evidence that eating dirt leads to ulcers, but I don't think we can say that it is impossible. I think multiple disease-causing factors can be involved."

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Data suggests that, industry wide, about 0.5% of neonatal calf deaths are attributable to abomasal ulcers. However, Rice says some producers lose 2%-3% of their calves nearly every year to acute peritonitis resulting from perforated ulcers. Even at that rate, ulcer-related calf deaths do not represent huge costs, but most affected producers want to know why it happens and what they can do about it. Frustrating the search for answers are the inconsistencies associated with this problem.

## Symptoms of ulcers

According to Rice, ulcers may prompt symptoms very similar to those associated with enterotoxemia. Calves may appear listless and a little bit full or bloated. Bloat may be the most frequently observed symptom. Signs of a bellyache can include frequent stretching out, grinding of teeth, tail-wringing or kicking at the abdomen. Calves may scour and their stools may be darkened by the presence of blood.

All too often, few if any symptoms are observed. Producers commonly report that a big calf that appeared to be healthy and doing well the day before was found dead. Many times that "sudden" death strikes calves that are 6 to 8 weeks old. However, much younger calves may be affected. Stress, Rice says, may be a common denominator. In his experience, a higher incidence of ulcers often follows periods of bad weather or other stressful conditions.

"It could be that stress, in combination with other factors related to nutrition and bacterial or viral infections, contributes to the formation of ulcers," Rice adds.

## Causes of ulcers

According to Dale Miskimins, veterinary pathologist at South Dakota State University (SDSU), the idea that ingested dirt contributes to the problem by creating a gastric irritation is popular. Some people believe hairballs in a calf's stomach could cause abrasions as the abomasum undergoes its typical rhythmic contractions. Miskimins says there is no evidence to confirm that either source creates irritation that leads to ulcers or enterotoxemia, and both dirt and hairballs are frequently found during postmortem examinations of calves known to have died from other causes. Conversely, ulcers may affect calves that have not ingested dirt.

According to Miskimins, cattle may eat dirt in an attempt to seek out some mineral that is deficient in their diet. However, they often exhibit the same behavior when adequate mineral supplementation is provided. Many veterinarians suspect that it may be a *symptom* of a bellyache, rather than the cause.

"We think calves sometimes lick the dirt in an attempt to soothe a gastric disturbance. They might also do it out of boredom. We don't really know," Miskimins states. "And we don't know what to do to prevent it."

Miskimins says some studies point to a connection between bacterial infections and ulcers. *Clostridium perfringens* are bacteria whose five different types (A, B, C, D and E) are widely distributed in the soil and in the intestinal tracts of animals. Types C and D are generally considered responsible for producing the toxins contributing to enterotoxemia. Type A has been associated with gastrointestinal lesions and some

CONTINUED ON PAGE 92

## What's the Connection? CONTINUED FROM PAGE 91

researchers suspect it could play a role in the formation of abomasal ulcers. Others cite instances where Salmonella bacteria or bovine viral diarrhea (BVD) might have been involved.

Another study, Miskimins adds, points to bloat as a possible cause. Proponents say reduced circulation and damage to blood vessels resulting from the pressure of gas distention could start an ulcer.

From the standpoint of nutrition, another popular theory suggests that trace-mineral deficiencies or imbalances might set the stage for ulcer formation. Copper and other trace minerals are considered important to proper immune system function. Limited field evidence gathered by the University of Wyoming showed copper levels to be low in the livers of calves that died as a result of ulcers, and routinely low copper levels and frequently high levels of molybdenum (a copper inhibitor) were found among calves suffering from ulcers evaluated by the University of Nebraska. However many veterinarians maintain there is insufficient research to support trace-mineral deficiency as a single cause of ulcers.

"There are plenty of theories about what causes ulcers. None has been confirmed or discounted completely," Rice adds. "I know of instances where producers wanting an answer paid hundreds of dollars for diagnostic work and still didn't find a smoking gun. There simply may not be one cause, but a combination of them."

### Prevention

What should producers do when they find calves that exhibit symptoms like those mentioned earlier? Unfortunately, Rice says, it is hard to tell if the calf is suffering from an ulcer or from enterotoxemia. He recommends initiating treatment for the latter, favoring administration of *C. perfringens* types C and D antitoxin, antibiotics, an anti-inflammatory drug, and a dose of mineral oil.

"If it is enterotoxemia, that treatment has worked well for us. And calves usually respond quickly," Rice reports. "If it's an ulcer that has progressed very far, well, those generally are fatal."

For producers experiencing an increase in fatal ulcers among calves, Rice recommends preventive measures, including increased clostridial protection. Vaccinating calves shortly after birth may help, but vaccinating cows might be better. Administering *C. perfringens* toxoid to cows, prior to calving, will boost the passive immunity their calves receive through colostrum.

"Increasing the quality and quantity of colostrum delivered to the calf will help," Rice states. "That means providing a good health program and proper nutrition for the cow, with mineral supplementation to correct any deficiencies. That includes minimizing stress as much as possible. In general, good management is important."

High incidence of fatal ulcers in baby calves could be a red flag, Rice warns. When a herd is also suffering from other problems, such as low reproductive performance or an increase in summer pneumonia, it is time for the producer and his or her veterinarian to look for reasons.