

Botulism in Cattle

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Clostridium botulinum is a bacterium that produces one of the most potent classes of toxins known to man. The spores of these bacteria are wide spread in the environment but are dormant. Under anaerobic conditions and with the right nutrients, the spores can germinate and grow thereby releasing toxins. There are eight known botulism toxins that are produced but there is some species specificity. For example, types A, B, C, and D toxins that commonly affect livestock. The type B toxin is usually found in our region and is often associated with poorly fermented legume or grass silages (especially ryeilage) with high pH (> 4.5). There has also been an increased frequency of the disease with the advent of using big bales wrapped in plastic. I believe that this is due to the fact that microenvironments abound in wrapped baleage that are conducive for growth of *C. botulinum*. Botulism toxins are not commonly found in corn silage because the pH (usually less than 4) prevents the growth of the bacteria. To minimize the chance of botulinum toxicosis from silage, harvest plastic-wrapped silages at correct DM content (about 50%) and store them in areas that will prevent damage to the plastic from the environment or from critters. Use of a microbial inoculant will also help to decrease the pH of silage more quickly and may help to prevent the growth of *C. botulinum*.

Type C botulism toxicity is usually associated with decomposing carcasses. Type C toxicity has been reported with feeding of poultry litter to ruminants. In some instances botulism toxicosis can be due to the consumption of silages that were contaminated with animal carcasses during ensiling or feeding. In a recent botulism outbreak in California, 420 adult cattle died in a week period due to a dead cat carcass that had contaminated a TMR!

Botulism toxicity on dairy farms occurs via ingestion of the toxin. The potent neurotoxin impairs transmission of electrical impulses from nerve to muscle. Tongue weakness is a common associated symptom of botulism toxicosis. In most cattle, the tongue will retract into the mouth if it is pulled out to the side. In affected cattle, the tongue may lie limp after being pulled or will be slowly retracted. Jaw movement and muscle tone is also severely compromised. Cattle with botulism will also drool due to the fact that they have a difficult time swallowing. Botulism toxicity is often first diagnosed as an animal with "downer cow syndrome". When an outbreak occurs, it often affects multiple animals and at any stage of lactation. Animals also usually do not show signs of nervousness or apprehension, which eliminates diagnosis for listeriosis or milk fever. In fact, cattle with botulism toxicosis will not respond to a second dose of calcium. Absolute diagnosis of the disease depends on identification of the toxin in the feed or rumen but spores can also be isolated from these sources. Death in cattle is often due respiratory failure, dehydration, or complications of being down for prolonged periods of time. Cattle can recover from moderate exposures to botulinum toxin within 5 to 10 days.