

Combating Clostridial Disease

New protocols suggest strategies to help boost immune response for newborns and calves at pre- or post-weaning.

by Kindra Gordon, field editor

Overeating disease, blackleg, edema, tetanus and botulism — while each of these conditions have different symptoms in affected cattle, they also have commonalities. Foremost, they are all caused by clostridial bacteria; and secondly, if an animal is infected, the condition is typically fatal.

Thus, vaccination to protect against clostridial disease has become commonplace in the cattle industry — dating back to 1932 when the first clostridial vaccine against blackleg in cattle was developed. In spite of that, Vic Cortese, a technical veterinarian with Zoetis, says there is still a lot of misunderstanding in how to control clostridial disease.

He explains, “Clostridials have been a forgotten disease in cattle because it is not contagious, so usually we don’t see big outbreaks.” As a result, Cortese says there wasn’t urgency for research on newer vaccines and protocols. But over the last few years, he reports clostridial vaccines have been reexamined “to see if they work the way we thought.” That research has yielded new recommendations with regard to timing and vaccination protocols, as well as prevention steps to decrease

ingestion of clostridial bacteria spores, which can live in the soil for more than 50 years.

Before digging into those recommendations, a basic understanding of clostridial bacteria pathology is beneficial.

Naturally occurring

Clostridial bacteria are naturally occurring in the environment and

live throughout the world in soil. The bacteria tend to be more prevalent during drought or in overgrazed

pastures because the soil is exposed.

“The primary job of clostridials is to break down dead material,” Cortese says. “It’s nature’s own garbage disposal.”

As livestock eat grass, they ingest clostridial bacteria. To this, Cortese says, “Clostridials are an optimistic bacteria ... they are always circulating through the animal looking for an opportunity to grow.”

That said, Cortese notes clostridial bacteria can’t grow in a healthy animal, they only grow where there is no oxygen. In a dead animal, within four to six hours, clostridial bacteria go to work at decomposition. In a live animal, clostridial bacteria require

blood flow to be distributed to a bruise or injury. If that occurs, the bacteria begins to grow and release exotoxins. Toxins released by the different types of clostridial bacteria can attack specific parts of the body — and they are some of the most lethal toxins known.

Clostridial bacteria are generally grouped by the toxins they release.

Enterotoxins — from *Clostridium perfringens* — result from overeating and affect the gastrointestinal tract. Cortese notes this is most commonly seen in young or “growthy” calves that are still nursing.

Histotoxins cause gangrene or muscle/brisket lesions resulting in blackleg, malignant edema or gas gangrenes. *Clostridial hemolyticum*, from liver flukes, can lead to redwater disease.

Neurotoxins are toxic to the nervous system resulting in tetanus and botulism. Cortese notes that botulism is typically found when a dead animal is in feed — such as a bird or rodent. Thus he says, “It’s important not to allow those to be mixed into the feed.”

Vaccination scenarios

Because clostridial disease is typically deadly once an animal is affected, vaccination is recommended as a preventative strategy. However, clostridium vaccines are available

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in many different combinations, therefore, understanding the various products and protocols is crucial.

In newborn calves, Cortese explains that *Clostridium perfringens* is the primary concern. Vaccination protection options include vaccinating the cow prior to calving or vaccinating the newborn calf at birth.

“Vaccinating mom allows the calf to gain protection from colostrum,” Cortese explains. Recommendations call for the cow to receive a 7- or 8-way clostridial vaccine four to 11 weeks prior to calving to allow the cow time to respond to the vaccine and produce antibodies to be in the colostrum. “Six to nine weeks prior to calving is optimum, and that coincides with when other scours vaccines would be administered,” Cortese says.

He continues, “If you can’t vaccinate the cow, you can vaccinate the calf

at birth. However, we recommend using a *Colostridium perfringens* C, D or A vaccine. You don’t want to use a 7- or 8-way vaccine in a newborn calf because that product decreases intake and the protection goes down.”

Including tetanus with the vaccination may also be considered if early band castration will be used.

For vaccinating older calves prior to sending them to summer grass, Cortese issues caution if a 7-way and viral vaccine are being administered at the same time.

“Research work shows when vaccinating calves for the first time with an injectable IBR and a bacterin, only one in three will respond,” he says. The IBR may block the clostridial immune response.

How can this scenario be avoided to get a better response? Cortese says research shows the first time IBR is administered should be nasally when the clostridial vaccine injection is

given. This way two different immune system responses are being activated to get a full take of the vaccinations.

Additionally, he shares that new research suggests the intranasal immune response in calves also lasts longer than the injectable.

Cortese notes, “This doesn’t change by age, it is based on the first response to the vaccines.” This means a booster dose of IBR could be administered as an injection.

Another caution from Cortese is to avoid vaccinating calves with

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clostridials at weaning because of the decreased intake they cause for a brief period after vaccination. Thus administering the vaccine pre- (or post-) weaning is preferred.

For adult animals, Cortese suggests clostridial vaccination may be considered for groups that will receive a prostaglandin injection to synchronize estrus.

“When you give prostaglandins at the injection site it restricts blood flow — which can be an opportunity for clostridial bacteria,” he says. “Producers may want to consider giving a clostridial vaccination each year to decrease risk postsynchronization.”


Management matters

To prevent or decrease the risk of clostridial disease, Cortese notes

some key management steps should be employed. These include:

- Ensure consistency of feed intake. Among newborns, if a calf is only nursing intermittently due to cold or hot weather, they are more likely to overeat, says Cortese. The same is true with weaned calves; clostridial disease tends to strike the biggest, growthiest calves if they are overeating.
- Minimize crowding, bullying or rough trucking to reduce bruising, which decreases opportunities for clostridial bacteria to get established.
- Minimize overgrazing in pastures to prevent livestock from picking up excessive clostridial spores from the soil.
- Minimize access to areas with

rotting or spoiling vegetation or dead wildlife or livestock, because clostridials will be at work in these areas decomposing the dead material.

- All total, Cortese encourages reevaluating your herd vaccination program and working with your local veterinarian to develop an effective vaccination protocol. 



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