A Better Foundation

Extension beef specialist advises on calf health management.

by Jessica Wesson, editorial intern

Starting well with the basics can make or break your beef cattle herd. Often the success of a carcass on the rail or a mama cow in your pasture can be attributed to the management at the beginning of that animal's life.

A.J. Tarpoff, assistant professor and extension beef veterinarian at Kansas State University, discussed the importance of calf health management during an Angus University webinar.

The biggest goal is resiliency for calves, Tarpoff said. "I compare it to the shocks on your pickup truck," he explained. "You want a good suspension system to go over the bumps in your fields. Every investment we put into our calves is really building that suspension for them to be successful."

The growing defense

The immune system of a calf is constantly changing over time, he pointed out. Calves have a fully functional immune system when they are born, but it is still developing.

"Think of the immune system as a muscle," Tarpoff said. "In order for a muscle to get big and strong, it has to be under a strain."

Calves receive passive immunity from their mother's colostrum, directly transferring immune system cells from the cow to the calf in the first hours of life.

"It's really important to get the cow's colostrum absorbed early in that calf's life," he said. "It acts as the calf's functional immune system for the first few months, and later the calf develops their own."

First milk, best milk

Colostrum contains vital components for calves, such as antibodies, fat, vitamins and white blood cells.

"It's like a magic juice, but it has to be given at the right time in the right amount," Tarpoff said.

He estimates calves need about 1 gallon of quality colostrum within the first couple of hours of life. There is a well-known rule in the cattle industry that calves need colostrum within the first 24 hours of life, but Tarpoff said that's not soon enough.

A calf's intestinal lining has a higher absorption rate during the first few hours of life, but the closure starts at around six hours after birth. By nine hours the lining is 50% closed.

"It's less efficient for those critical nutrients to absorb the longer the calf goes without nursing," Tarpoff said. "That's why we recommend having the calf up and nursing within the first two to four hours."

Calves that do not receive high-quality colostrum early in life have major consequences, he said. These calves are:

- 6.4 times more likely to get sick as a newborn;
- 3.2 times more likely to get sick preweaning; and
- 5 times more likely to die.

Replacer and supplements can serve as a substitute or an additive if the calf is not able to get the all-too-important colostrum, Tarpoff said. Both come in a powder form that can be mixed

with warm water, but they are not the same.

"Replacer is more expensive, as it should be," Tarpoff said. "We try to shoot for replacer products that have over 100 immunoglobulins (Ig). That gives all the cell functionality that the calf will need to get a good start at life. Supplements are much cheaper, but only half as [effective]. They truly are just a supplement."

Replacer is needed for animals that are not nursing at all or nursing very little, while supplements serve as a boost for calves that might not be getting high-quality colostrum or not getting the amount they should be.

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Good immunity transfer

Many factors that affect the quality of colostrum that a calf receives directly relate to the mother, said Tarpoff. "It's the care of our cow herd 365 days of the year that largely affects the colostrum that, in turn, affects productivity of the calf."

The age of a cow contributes to the quality of her colostrum, Tarpoff said. Mature cows that have had a few calves tend to produce the best colostrum. Young cows produce the next-best colostrum, while heifers produce the lowest-quality colostrum.

They haven't gone through the process before, and their own bodies are still maturing.

The biggest predictor for colostrum quality is body condition, Tarpoff said. Typically, lactation takes a lot out of a cow, so she would need at least a body condition score (BCS) of 5 on a 9-point scale to produce high-quality colostrum. He advised producers to start checking cow body condition months before calving and continue through gestation to weaning.

Lastly, Tarpoff said, calves should be born in a clean environment, and their delivery should be as easy as possible.

Cold-stressed calves

The normal body temperature of a newborn calf should be 101°-101.5° Fahrenheit (F). Producers start to see mild effects once the calf's temperature drops below 100°, Tarpoff said. When the temperature decreases past 94°, the calf will experience severe issues. If the calf's body temperature dips to around the mid-80s°, the calf will enter a comatose state.

If the calf is down, has a cold mouth and the weather is cold, then it might be time to call the veterinarian.

Tarpoff recommended ranchers carry a thermometer with them during calving season to check temperatures of newborns to better assess the situation. This will help the producer decide whether the calf should go to the veterinarian or if it simply needs to be warmed up.

"There are a number of safe ways to warm calves up," Tarpoff said. "The old tried-and-true is the floorboard heater of your pickup. One thing I like to do is take a piece of cardboard to lay over the top of them so that heat will circulate under there."

Other strategies include heat lamps, blankets and warm-water immersion. Placing them in water is one of the most effective methods, but it requires extreme caution, he emphasized.

"You don't want to put them directly into hot water," Tarpoff said. "What you want to do is put them into lukewarm water and raise the temperature by consistently adding warmer water. If they are warmed too quickly, they could develop cold shock."

Warming cold calves can take one to two hours. Be patient, and let the calf's body temperature rise at a steady rate to prevent shock, warned Tarpoff.

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Diarrhea decoded

Neonatal diarrhea, also known as scours, is a common occurrence in young calves, he noted. Causes include bacteria (*E. coli*, salmonella), viruses (rota, corona) and protozoa (crypto, coccidia). Most of these pathogens are naturally found on farms and ranches.

E. coli affects calves from Day 1 to Day 5. Rotavirus, coronavirus and cryptosporidia are the most common pathogens that cause scours, and they are mostly present when the calf is 5-20 days old, he explained.

Mature cows tend to produce the best colostrum.

One of the best ways to help prevent scours is to calve in a clean environment, Tarpoff said. Still, the last one-third of calves to be born within a herd with a normal to extended calving window is at increased risk of developing scours due to environmental contamination of the calving ground.

Tarpoff shared some simple solutions to keep pathogen levels as low as possible:

- Move calving shelters several times during the calving season.
- Change up the feeding area.
- Make sure cattle have fresh bedding in a clean resting area.

Older calves can pass on the pathogens to younger calves, so keeping them apart is important.

"Calves born earlier in the season get exposed to these pathogens at a lower level," Tarpoff said. "They don't get sick, but they do take in these pathogens where they amplify inside of the calf. These older calves act as a reservoir and produce a large number of pathogens into the environment."

It is often necessary to graft, or pair a mother with a calf she didn't calve. Sometimes that means bringing in an animal from another operation, but that could introduce new pathogens, Tarpoff warned. The new animal might need to be quarantined for 30-45 days once it arrives to the new location.

Dealing with scours

Sometimes scours occurs despite good management practices. When a calf suffers from neonatal diarrhea, the biggest concern is fluid loss, Tarpoff said. If caught early, a simple solution of oral electrolytes may be the best treatment — as long as the calf has a warm tongue and is up and nursing.

If the calf is down, has a cold mouth and the weather is cold, then it might be time to call the veterinarian, Tarpoff said. The calf could be in critical condition and require IV fluid therapy.

If more than one calf is sick, it might be time to start thinking about running a diagnostics test, he said. The veterinarian can take fecal samples, or send necropsy tissue samples to the lab. Running a diagnostic test tells producers which pathogens are affecting their herd.

Whether it's preventative strategies or dealing with disease as it comes, taking care of that calf early on will add up later, Tarpoff said.

Editor's note: Jessica Wesson is the *Angus Beef Bulletin* summer intern. You can access this webinar at *https://www.angus.org/university/webinars*.