Herd This?

Volume 5, Issue 1 April 2015

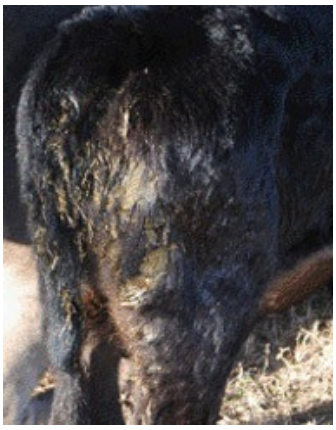
Don't forget to call our office at (910) 655-2442 and set up appointments for:

- **Pregnancy checks for fall calving herds**
- **Bull tests for spring 2016 calving herds (recommended in the 60 days prior to the bulls going in)**
- **Herd Health Evaluations**
- **Herd Vaccination Ordering and Deworming Recommendations**

The office also has a new email: pineviewveterinary@gmail.com

Inside this issue:

Calfhood Diarrhea - Scours



It never fails that every year producers are faced with the occasional calf or two that develop diarrhea (scours) and the truth is that treatment is difficult, labor intensive, costly and sometimes unsuccessful. Prevention is the key and throughout this article we will touch briefly on the various pathogens that cause calf diarrhea, how to determine if your calf is in need of veterinary care, minimum electrolyte requirements and strategies for prevention.

Pathogens

Rotavirus, Cryptosporidium, coronavirus, enterotoxigenic E. coli (ETEC), Coccidia and Salmonella are recognized as the major pathogens associated with diarrhea in beef calves with Salmonella most prevalent among intensive calf rearing systems. Bovine Viral Diarrhea (BVD) is infrequently associated with diarrhea in young calves however in older calves it is a consideration. Producers can look at the age and clinical signs a calf with diarrhea is exhibiting to help suggest a specific pathogen responsible. For example, straining, frank blood and mucus are suggestive of Salmonella, coronavirus, and coccida. Paired with the age of the calf an educated guess can be made for the pathogen involved. Refer to the chart below for more pathogen to age of calf tendencies.

Pathogen	Days Old When Affected
ETEC	3
Rotavirus	15
Coronavirus	21
Coccidia	>30
Cryptosporidium	35
Salmonella	42

There are primarily two modes of action that the pathogens take to cause diarrhea:

1. They can cause the cells of the intestinal wall to malfunction in their ability to resorb fluid within the gut. Protozoa and viruses primarily act this way.

-OR-

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Zoetis/Pineview Veterinary Hospital FFA Support

Zoetis, formerly Pfizer Animal Health has partnered with several organizations to give back a portion of the purchases of qualified Zoetis cattle made between February and April 2014. Pineview Veterinary Hospital has chosen to have these funds funneled back to our community into the local FFA Chapters to promote the success of our young people through agricultural education. We encourage you to purchase your Zoetis vaccines and dewormers from us before April 30th so that we can give as much as possible to our local FFA Chapters.

Columbus County Cattleman's Association Meeting

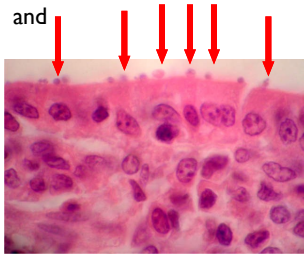
The next meeting of the Columbus County Cattleman's Association will be on September 8th at 7pm in Whiteville, NC.

Scours (con't)

2. They can alter the function of the intestinal cell wall, causing them to over produce intestinal fluid. ETEC and Salmonella act this way.

A specific strain of E.coli (K99) causes diarrhea by eliminating the calf's ability to digest and absorb nutrition at all. This is not really a unique specialty of this bacterial but the fact that it only causes diarrhea in calves under a week of age is quite special. You will find throughout this article that there are unique characteristics between each diarrhea causing agent that make them special and in turn helps diagnose which agent is the likely cause of your calf's diarrhea. Whether it is the age of onset or the color of the diarrhea these important facts help determine which bug to test and treat for.

Viruses such as Rotavirus and Coronavirus as well as the protozoan parasite Cryptosporidium kill intestinal cells completely such as parvovirus does in puppies. They also tend to cause a watery yellow colored diarrhea. Bacteria such as E.coli and Salmonella invade the deeper layers of the intestinal lining and rapidly destroy it. Generally this group of diarrhea causing agents causes the release of blood and mucus into the diarrhea.



The red arrows are pointing to the Cryptosporidium parasite as it sits on the lining of the intestine.

To make things more complex calf diarrhea is typically caused by two or more of the fore mentioned pathogens working together to destroy the intestinal lining. The severity and duration of a diarrhea or scours episode is related to the following factors:

1. The number of each agent involved (i.e., sanitation).

2. The extent of intestinal destruction created by each pathogen -- their effects are additive. In addition it is important to remember that different strains of each pathogen exist, and differ in their capacity to induce severe disease.

3. The amount and quality of colostrum consumed by the calf from the dam.

4. The severity of other stresses (wetness, cold, need to fight off other diseases and poor nutrition caused by poor maternal milk production or deficiencies of certain trace minerals or vitamins).

TREATMENT

The challenge we face in treating diarrhea causing organisms is that parasites and viruses do not respond to antibiotics, leaving the only treatment as being supportive nutritional and fluid therapy until the intestinal lining has time to regenerate. Bacterial causes however are sometimes responsive to antibiotic therapy however if a calf has a mixed population of virus and bacteria causing diarrhea you can see where treatment is a challenge. This is why antibiotic treatments are always coupled with fluid therapy.

When the intestine is damaged, the water and nutrients in the dam's milk can't be completely absorbed into the calf's bloodstream. As a result, a large fraction of water is lost from the calf's body in the diarrhea. This loss is the greatest threat to the survival of a scouring calf. Therefore, it must be a primary treatment focus. The fluids lost in the diarrhea quickly deplete the calf of water and salts, producing symptoms of dehydration -- sunken eyes, weakness, and dryness to the mouth and nostrils. As the calf loses body fluid through diarrhea, its blood thickens, making it harder for its heart to deliver blood to its tissues. Meanwhile, the loss of salts from the calf's body creates an imbalance in the normal pH of the calf's system. As acidity takes over, acidosis sets in. Calves with acidosis are weak and uncoordinated, often exhibiting a drunken, wobbly gait when made to walk. When encouraged to nurse, their suckle response is just a weak chewing motion. As acidosis worsens, the calf can't stand, becoming lethargic and sleepy. Very advanced cases become comatose. The function of the heart and lungs is greatly impaired in cases of acidosis, and many advanced cases die of cardiac arrest.

Another common problem in cold weather when calves are facing diarrhea is low blood sugar. The calf expends its own sugar reserves trying to keep warm. If it can't absorb milk nutrients from its damaged intestine, its sugar reserves aren't replenished leaving it susceptible to death very quickly. Calves with low blood sugar usually develop subnormal temperatures (below 100 degrees F) as they lose the ability to maintain body heat. Low blood sugar contributes to the symptoms of weakness and lethargy induced by acidosis. Thus, several problems are simultaneously at work: dehydration, acidosis and low blood sugar. Couple this with inadequate amounts of colostrum the first day of life and the result is the likelihood of simultaneous infections in other organs due to a underdeveloped immune system.

Treatment involves correcting the fluid deficit and electrolyte imbalance. The use of antibiotics in cases of non-specific diarrhea is controversial within the veterinary profession. It

Scours (con't)

will usually not affect the outcome, but it rarely makes things worse therefore antibiotics are often given in the face of calf diarrhea.

When it comes to fluid treatments for calves with diarrhea the key is to realize the magnitude of the fluid deficit. For example, a 100-lb. calf that's 10% dehydrated needs 10 lbs. of fluids to just correct the immediate deficit. If 1 gallon of fluids weighs 8 lbs, the calf needs somewhere around 1.25 gallons. Giving a calf 2 quarts, two to four times a day, may be necessary to correct and maintain the fluids. Oral fluid correction of dehydration is of course contingent on weather the calf is suckling or not. Refer to the chart below to help you determine how dehydrated your calf is and whether or not IV fluid or oral fluid therapy is necessary.

% Dehydration	Demeanor	Sunken Eye	Skin Tenting
<6%	Normal	None	None
6-8%	Depressed	2-4mm	1-3 sec
8-10%	Depressed	4-6mm	2-5 sec
10-12%	Comatose	6-8mm	5-10 sec
<12%	Dead	8-12mm	>10 sec

Severe dehydration (>10%) should be corrected using intravenous treatment which is done by your veterinarian. In addition, most calves with diarrhea will be acidotic. Oral electrolyte solutions with an alkalinizing agent such as bicarbonate are then necessaryto help correct this pH imbalance. Carefully read the label to find products that contain bicarbonate. Usually, they're more expensive but are worth it.

The degree of eyeball recession into the orbit provides an indicator of severity of dehydration.

As a general rule of thumb it is never a good idea to mix electrolytes with milk in one feeding as the electrolytes will interfere with the milks ability to curd and digest properly within the calf. This will often cause further stomach cramping and pain. Instead it is suggested that you alternate milk feedings with electrolytes feedings about every 4 hours. Good electrolytes on the market will have glucose (no more than 200mmol/L), potassium (20-30mmol/L), chloride (50-100mmol/L), sodium (70-145mmol/L), glycine (no more than 145mmol/L) and one of the following alkalinizing agents such as bicarbonate, citrate, propionate, acetate, or lactate (50-80mmol/L). Examples of such products are Hydrolyte and Resorb which come in individual packets and range in price.

PREVENTION

Remember, scours prevention is the most important and cost-effective area to invest your time. In my opinion it comes down to these three broad points:

1. Good general hygiene to minimize exposure, thus preventing disease. There are numerous opportunities for improving sanitation. A few include improving the general sanitation of calving lots, disinfecting calving barn pens between occupancy, sanitizing calf treatment equipment between uses and isolating scouring calves.

2. Make sure the calf gets enough colostrum. This is the single most important determinant of the calf's immune status during the neonatal period. Failure to do this means a 3- to 10-fold increase in the calf's risk of becoming sick.

3. Proper cow vaccination against E. coli and rotavirus and coronavirus can increase the antibodies she passes through her colostrum to the calf. Vaccination against these pathogens tend to occur in dairy settings however more intensive cow/calf operations could justify adding this preventative step to their health program.

The complex, interrelated nature of these strategies makes prevention a challenge. For example, implementing a sound vaccine program (prevention strategy 3) will be totally ineffective if calves don't suckle enough colostrum (prevention strategy 2). Likewise, even if you accomplish prevention strategies 2 and 3, if the environment in which the calves are born is heavily loaded with scours pathogens (strategy 1), it will overwhelm the calf's immunity and scours will result.

Calf diarrhea is one of several management disease complexes where integrated prevention strategies and attention to detail in multiple areas are required for success.

For questions, comments or concerns about calf diarrhea in your herd please contact Pineview Veterinary Hospital at (910) 655-2442 for a Herd Health Visit to your farm where we can help you take the first steps in figuring out a solution to your situation.

Find us on Facebook

So whether you eat or drink or whatever you do, do it all for the glory of God.

1 Corinthians 10:31

Pineview Veterinary Hospital is a large animal veterinary practice meeting the needs of horses and food animals in southeastern North Carolina and northeastern South Carolina.

Our mission is to provide high quality service to our clients coupled with the most advanced and progressive veterinary care for our patients with an emphasis on preventive and herd health medicine.

Pineview Veterinary Hospital
7263 Green Swamp Rd. S.
Bolton, NC 28423

Dr. Christine Long
Dr. Jennifer Freeman

Phone: 910-655-2442
Fax: 910-655-8552
E-mail:
pineviewveterinary@gmail.com
www.pineviewvet.com

A Letter to our Pineview Family

Winter is trying to leave and Spring is slowly peeking her head around the corner. With this change in season unfolding many of you know that there have been some changes at Pineview already. Dr. Heidi Hart is no longer the owner as she and her family have taken a courageous step into the missionary field over seas. I ask that you please keep them in your thoughts and prayers as they begin this next chapter of their exciting lives. On that same note I am very excited to begin my next life chapter with you as the new owner of Pineview Veterinary Hospital. I have been blessed with this wonderful opportunity and am thankful to be your new owner. I was welcomed with loving arms when I joined the Pineview family the Summer of 2011. Now I am even more grateful for the continued love and support that you (our amazing Pineview family) have extended to me. Rest assure that the same high quality, progressive large animal veterinary care that you deserve will continue as Dr. Hart established when the practice began in 2002. Keep your eyes open for new and exciting client education events, informative newsletters for our ruminant and equine cliental as well as discounts and other promotional events. God blesses us every day if we just open our eyes and look to him.

Sincerely,

Christine M Long, DVM

NC State Extension is holding a **FAMACHA Training class** on Tuesday May 5th at 4:30pm at Gray's Creek High School in Hope Mills, NC. The class will involve two parts—one with classroom instruction and the second with a hands-on portion at the school's farm. Please RSVP to Becky at (910) 862-4591 by Friday May 1st. The cost is $15 and should be brought with you that night.

FAMACHA is a system that uses the conjunctiva of sheep and goats to help characterize their parasite burden and to make decisions about which animals to deworm. Many of our sheep and goat dewormers have become ineffective in recent years and so our goal is to preserve the ones that are working for as long as we can.

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