

# PREVENTION OF CALF SCOURS

by Pat White, DVM

Diarrhea in calves can be an absolutely devastating catastrophe when it hits hard and in numerous calves. Prevention becomes important to reduce both calf morbidity (number sick) and mortality (number dead).

While many cases of diarrhea in calves can be mild and self-limiting, there are a number of pathogens that can cause serious illness and rapid death, sometimes even in the face of treatment. Calves are extremely susceptible to scours during the first 28 days of life. Bacteria and viruses attack the lining of the calf's intestines resulting in difficulty absorbing nutrition from milk. Profuse, watery diarrhea can result, causing loss of nutrients as well as fluid. Dehydration and acidosis may kill calves outright, but even those calves surviving severe diarrhea may be left permanently stunted.

Contributing factors to the development of scours include inadequate amounts of colostrum, poor quality colostrum, difficult and stressful calving, poor sanitation and cold, wet weather. Clinical signs include diarrhea, sometimes with blood or mucous, dehydration, rough haircoat, weight loss, weakness and death. If the event of an outbreak, you need to look for subtle signs of illness. I have found that calves just starting to become ill just don't look like they feel well, don't run away as quickly, don't eat as ravenously, and their ears may droop slightly, even when resting on the ground.

The most common agents responsible for diarrhea in newborn calves are rotavirus, coronavirus, *E. coli* bacteria (K99 pilus antigen) and *Clostridium perfringens* type C. All of these pathogens usually affect calves less than 28 days of age, although that is not a hard and fast rule. *E. coli*, in particular, is more common in calves less than 1 week old. While some articles give suggestions as to a particular color and consistency of diarrhea (green, watery brown, bloody, yellow foamy or white) the causative agent cannot be accurately diagnosed by type of diarrhea.



*Highlands at Cheek Farm, Fair Grove, MO. Photo by Cindy Cheek*

Laboratory cultures or detection of DNA (PCR) is usually necessary to determine what culprit is involved. Sometimes there is more than just one. Rota and corona viruses will not respond to antibiotics but the severe damage done to the gut lining often results in a secondary bacterial infection and antibiotics may be necessary. Clostridial enteritis, (enterotoxemia) caused by *Clostridia perfringens* A, B, C or D (C being most common) is actually the result of a poison produced from the bacteria. While antibiotics may kill the bacteria, they will do nothing for the preformed toxin and a specific antitoxin may be necessary. While there are other organisms, such as coccidia and cryptosporidia that are capable of causing diarrhea, this article is limited to the prevention of diarrhea caused directly or indirectly by bacterial and viral pathogens.

Prevention of calf scours can be a complicated undertaking. Good quality colostrum and a guaranteed intake of antibodies is the first line of defense and the key upon which most of the other measures depend. Sanitation is the other means to control and prevent scours. Ideally, both will be utilized.

There is only one practical way to get antibodies against these diseases into the newborn calf, and that way is through the mouth into the gut, where the antibodies are absorbed into the

bloodstream or work locally to prevent adhesion of pathogens to the gut wall. There are two basic methods employed here; vaccinating the cow against these pathogens so that her colostrum is full of specific antibodies or purchasing products with the antibodies already in them and give these directly to the calf as soon after birth as possible. These products are also antibodies and just like colostrum, the sooner after birth they are given, the better and more completely they are absorbed. Both colostrum and specific antibodies may be given at birth.

Vaccinating the cow can be cumbersome and requires good handling facilities. Directions must be followed precisely, with the vaccination and booster given at a prescribed time period prior to calving, to ensure that antibodies in colostrum are maximized. Both Pfizer (Scour-gard) and Novartis (ScourBos) make vaccines for pregnant cows. There are differences in the vaccination schedule and the pathogen combinations for these products and also significant differences in slaughter withdrawal periods. Initial vaccination can occur 16 weeks prior to calving with a booster dose within 4 weeks of calving for ScourBos9, with a 60 day slaughter withdrawal. Scourguard 4KC requires 2 doses 3 weeks apart, with the 2nd dose 3-6 weeks prior to calving and has a 21 day slaughter withdrawal. These products have the potential to do tremendous good

but the most important part of the equation is that you must ensure that the colostrum, with all those lifesaving antibodies, gets into the calf during the appropriate timespan for absorption.

In lieu of the dam's own colostrum, there are excellent dried colostrums available for purchase. These products are light years ahead of what was around just a few years ago. An exceptional one is available from Alta Genetics in Wisconsin ([www.altagenetics.com](http://www.altagenetics.com)). Calf Choice Total or Land o' Lakes Colostrum Replacement are both manufactured by Saskatoon Colostrum Company. Considering the importance of colostrum to the future health of the calf, it seems wise to have a couple of these packages kicking around for emergencies. One or two packages are considered a total colostrum replacement in the event that none is available from the dam, for whatever reason. In the case of Calf Choice Total, each serial lot is produced from colostrum collected from over 3000 cows. Not all the cows are vaccinated for enteric disease but many are, and it is likely that this replacement product has antibody levels as high or higher than most maternal colostrum.

There are several products available that are given directly to the calf at birth and supply antibodies against bacteria, viruses or toxins. First Defense is a bolus that contains antibodies against E. Coli and coronavirus. It is given as soon after birth as possible, just like colostrum. Personally, I find boluses a little difficult to give to neonatal calves; the balling guns, even when designed for calves, seem large and awkward in the mouth of a Highland calf. I actually put boluses down with my fingers and find pushing them to the back of the throat and over the base of the tongue more precise than when it is done with a plastic balling gun. Ecolizer and Ecolizer+C20 are oral pastes or liquid, the former with antibodies directed against E. coli and the latter with antitoxin against Clostridia perfringens type C added. Pastes and liquids are usually easy to administer to a calf but with both pastes and boluses, it is wise to ensure nursing takes place immediately after administration so that the products end up in the stomach and then intestines where they are absorbed and not hung up in the esophagus. There are other products that claim to be effective for administration of antibodies to newborn calves but I have yet to see convincing documentation that these products work as claimed. Some claim to be the same as First Defense yet list no antibodies in

the ingredients. Others claim to provide antibodies for both calf and pig pathogens, which would seem unnecessary when preventing calf scours.

Another method to protect the calf is to vaccinate so as to stimulate its body into producing antibodies rather than relying on premade antibodies in colostrum or supplements. Pfizer makes an oral vaccine to be given to newborn calves for rotavirus and coronavirus called Calfguard. The most difficult part of this product is that colostrum antibodies can destroy the vaccine viruses so that they do no good. It is recommended that the product be given prior to colostrum intake and separated by at least one hour from colostrum. This can be difficult to achieve unless you are right there to remove the calf from the cow when it is born. Results achieved after using this product can be disappointing.

Probably one of the most promising methods to prevent calf scours is called the Sandhills Calving System. The principle concept of this method is to reduce exposure to all pathogens involved in calf scours. This is accomplished using 2 techniques:

1. Segregating calves by age to prevent direct and indirect transmission of all pathogens, including protozoa, from older to younger calves
2. Scheduled movement of pregnant cows to new clean calving pastures to minimize pathogen concentration and contact time.

This concept is used extensively in the dairy industry with the use of individual calf hutches. However in the beef cow herd, where the cow is supposed to raise the calf, it becomes a bit more problematic. Calf scours is a condition that amplifies itself over the course of a calving season. Environmental exposure to the various causative organisms may occur through direct contact with other animals (older cows may be subclinical carriers and shed low numbers of organisms) or contact with contaminated surfaces. During a single calving season it is the multiplication and passage through infected calves that results in widespread and heavy contamination of the environment, the so-called multiplier effect. The exposure level of pathogens is a direct result of animal density (the higher the number of animals, the higher the pathogen numbers) and the multiplier effect (the greater the number of sick calves, the greater the number of pathogens and the greater the environmental

contamination). Cool, wet weather, common during most calving seasons, favors the survival of the disease causing agents. Eventually, with sequential infections (dam to calf, older calf to younger calf) the pathogen shedding increases exponentially. Finally the dose of disease causing agents reaches the level that exceeds the calf's ability to resist disease. These factors explain anecdotal observations that calves born later in the calving season seem more likely to contract serious illness.

The Sandhills method was designed to prevent scours by using clean calving pastures, eliminating direct contact between young calves and older calves, thus preventing later born calves from being exposed to an accumulation of disease-causing organisms in the environment.

Cows are moved into a first calving pasture as soon as the first calves arrive. Calving continues in pasture 1 for 2 weeks. Cows not calving after 2 weeks are moved to pasture 2, leaving existing cow-calf pairs in pasture 1. After one week, cows not calved are again moved to pasture 3, leaving behind pairs born in pasture 2. Each subsequent week, cows not calved are moved to a new, clean pasture, leaving behind pairs that stay in their pasture of birth. This results in cow-calf pairs distributed in multiple pastures, with most calves being within 7 days of age of each other (pasture one calves will be within 14 days of age of each other). Cow/calf pairs from different pastures may be commingled after the youngest calf is four weeks old and considered low-risk for neonatal diarrhea.

This scenario works extremely well, particularly in herds with tight calving intervals but may prove a bit more problematic when calving is stretched out over 90 days or more or if limited by amount of pastures available. Development of a specific plan for use in individual herds must be done well in advance of calving season, with consideration taken for feed and water availability in all locations. While not a simple endeavor, the Sandhills calving method has proven to be very beneficial in reducing incidence and mortality from neonatal calf scours.

Neonatal calf scours can be a serious and expensive complication in a cow/calf operation. Treatment is expensive, time-consuming, frustrating and sometimes ineffective. Prevention, while not 100%, will make life for both you, the operator, and the cows with calves much easier.