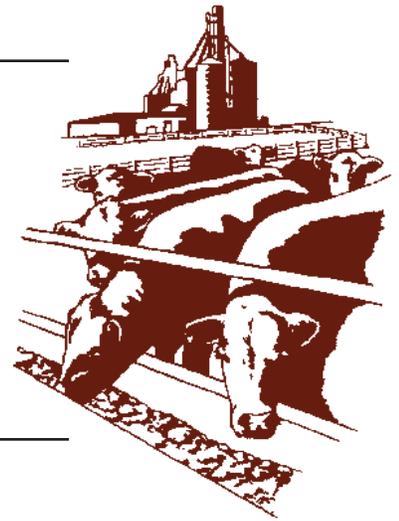


Beef Cattle Handbook



BCH-3056

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Calf Scours: Causes and Treatment

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There are several causes of disease and death in newborn calves. In many locations, the leading causes of beef-calf deaths are related to difficult births (dystocia). After that, however, the most common calfhood problems are infectious diseases. Of these, scours, or diarrhea, which occurs within the first several days of life, is the single most important cause of calf sickness and death in the United States. Almost no herd goes through a calving season without some scours. In severe outbreaks, the effects of scours in an individual herd can be overwhelming. Illness may occur in 70 percent of calves born and death may occur in 50 percent.

Causes and Effects of Scours

Many factors influence the occurrence of diarrheal disease. Factors that predispose calves to scours include: dystocia, exposure, poor nutrition of dam, poor health of dam, poor mothering ability of dam, etc. These factors may be difficult to control. When they occur, they lower the calf's ability to resist infectious diseases, and extra care of the calf is required to decrease the risk of scours.

When the calf's resistance is lowered, exposure to and invasion by infectious agents plays an important role in producing diarrhea. There are several different types of agents and a few of the most common will be discussed here.

Rotavirus and *coronavirus* are the most common viruses associated with calf scours. These two viruses have a similar mechanism of action in the calf. Both viruses infect the lining cells of the intestinal tract and destroy the cells that digest and absorb milk. Damage to the gut can be repaired if the calf survives. The usual

cause of death in infected animals is tremendous fluid and electrolyte loss leading to severe dehydration and acidosis (body pH changes to the acid side of neutral).

E. coli (*Escherichia coli*) is the most common bacteria associated with calf scours. It causes diarrhea by secreting a toxin that damages the cells lining the gut. This type of *E. Coli*, K-99, does not invade the gut cells nor kill calves, but causes enough damage to lining cells that large volumes of electrolytes and fluids are lost. Death may occur, as with other agents mentioned previously, if infected calves are not receiving supporting treatment.

Other types of *E. coli* are capable of invading the gut cells and causing severe disease. In this case, the bacteria can spread to any organ in the body through the bloodstream causing severe damage at these infected sites. It is important to distinguish between K-99 and these other types of *E. Coli*, because treatment for one will not effectively treat the other.

Cryptosporidia is another major agent associated with calf scours. This coccidia-like organism also affects the cells lining the gut causing decreased digestion and absorption. This agent generally does not kill calves. If infected calves do not receive supportive care, death may follow as described earlier by severe fluid losses and pH imbalance. This agent may infect humans and cause severe disease.

Salmonella bacteria are associated with calf scours and cause disease similar to *E. coli* (i.e, infect other organs as well as the gut). It is mentioned here because the sick calf with this bacteria is indistinguishable from calves sick with other agents and, like *Cryptosporidia*.

Salmonella can infect humans and cause illness as well. Do not take calf scours too much for granted. Calf handlers may be at risk of disease by treating sick calves. Take precautions by thoroughly washing your hands after handling sick calves.

Aside from these infections, there are also occasional cases of diarrhea caused by excessive feeding of milk. Known as nutritional scours, it results from fermentation of excess milk in the gut. Affected calves have loose stools but rarely become dehydrated and generally maintain good appetites. The common cause of nutritional scours is feeding large quantities of milk at certain times with long intervals between feedings.

There are other infectious organisms that contribute to scours such as *Campylobacter jejuni* and Bovine Virus Diarrhea but, regardless of the agent causing diarrhea in neonatal calves, the signs and course of disease are similar. The clinical signs result from excessive loss of water and electrolytes from the intestine, resulting in body pH changes and dehydration.

In early or mild cases, calves will show dryness of mouth, loss of skin elasticity, sinking of the eyes into the eye sockets, and extremities that are usually colder than the body. The worse the dehydration and chemical imbalance, the more severely affected the calf will become. More severely affected calves become depressed and weaker, may be unable to stand, lose their nursing reflex, and their body temperature drops to subnormal levels. If not treated promptly and correctly, calves move into stages of coma and shock. When losses are severe enough, affected calves will die.

Treatment of Scouring Calves

With this understanding of the causes and effects of diarrhea, we can devise effective treatment measures. By far the most important treatment measure is replenishment of vital fluids and electrolytes. Numerous formulas are now available commercially that are designed for rehydration, correction of pH imbalance, and replacement of lost electrolytes (K, Na, Cl, and bicarbonate). You should have a supply on hand to meet a scours problem before it occurs. Consult with your veterinarian for selection of product and volume of mixture to be given to treat sick calves.

In the early stages of diarrhea, calves are usually standing, therefore, products given orally can be effective. As the disease progresses and dehydration worsens, calves become weaker and depressed; thus decreasing their voluntary intake of fluids, even milk from the dam. Administered early and frequently, these fluids help the calf maintain vigor and allow it to continue sucking and to maintain normal body temperature.

Giving fluids too late or giving too little allows the progressive fluid loss to continue and the calf's condition to deteriorate. When dehydration and pH imbalance are severe enough, orally-administered fluids are not well absorbed; therefore, they do little to enhance the calf's survival. At this stage, the one way to prevent death is to give intravenous (I.V.) fluid therapy. The most

common mistake in the use of electrolyte replacement fluids is waiting too long before giving them to affected calves!

Other treatments besides fluids have been tried. Gut-lining protectants such as kaolin and pectin are favored by some, but their effectiveness in stopping fluid and electrolyte loss has been questioned. They may act to absorb toxins and thus help clear them from the intestinal tract. Pepto Bismol has been used with good success to protect the gut lining in cases of scours. These protectants are at least not harmful.

On the other hand, numerous treatments have been tried that affect gut motility. These drugs decrease gut motility, and the assumption behind their use was that hypermotility of the intestine was the cause of diarrhea. We now know that most of the agents that cause diarrhea decrease gut motility at the same time, and the use of these types of drugs is contraindicated.

Antibiotics are commonly used orally to treat calf scours. It is now believed by researchers and veterinarians that the overall effect of oral antibiotics is detrimental to calves. The common diarrhea agents mentioned previously are either not affected by antibiotics, or are highly resistant and do not respond well to most of the antibiotics commercially available for oral use in calves. Furthermore, *E. Coli, K99* is routinely cleared by the calf as long as fluid therapy is provided to keep the calf alive. The bacteria that invade the gut lining and get into the blood stream (other *E. coli* and *Salmonella*) will generally respond better to antibiotics given systemically (IM, SC, or IV).

Antibiotics given orally alter the normal population of organisms in the gut and sometimes predispose it to super infections or fungal infections. Some antibiotics used for scours actually inhibit glucose absorption and alter the cells that line the gut wall. In these cases, the continued use of antibiotics actually prolongs diarrhea.

Recently, the use of natural biological products to reestablish a normal balance of intestinal microorganisms has been suggested as a useful treatment for calf scours. Products containing either *lactobacillis* or *strep-tococcus faecium* are commercially available. Studies on their effectiveness are continuing, but it is likely that they are useful in cases of prolonged diarrhea.

Tips on the Use of Fluids for Scours

1. Initially, feed alkaline-based electrolytes at full dose (6 to 8 pints per 100 pounds) divided into two to four feedings for 1 or 2 days, then switch to a nonalkaline, high energy product. If the calf is responding well after 2 days, you may reduce the electrolyte dose to 3 to 4 pints per 100 pounds, but still feed 2 to 4 times a day for 2 days. Discontinue electrolyte treatment when diarrhea clears up. Continue to feed milk or allow the calf to suckle its mother while you treat the diarrhea.
2. Since most calves are acidotic at the start of scours (acidic) but may become alkalotic (basic) in a short time with continual use of alkaline-based products,

consult with your veterinarian for product selection and use them to prevent this overbalance in pH from acidic to basic. The idea of balancing electrolytes is to return a calf to near pH neutral. For example, begin with Life-Guard, Revive, or Biolyte for 1 or 2 days, then switch to Resorb, Ion Aid, or Calf-Lyte.

3. Basic electrolytes mixed with milk often prevent curd formation and hasten the flow of feed through the calf. Therefore decreased energy may be absorbed by the calf. Never mix electrolytes with milk. Wait at least 2 or 3 hours after feeding milk before administering electrolytes.
4. Never mix half milk and half water. This practice prevents the formation of curd in the calf's stomach.
5. Try to leave the calf with its dam. It isn't necessary to take milk away from a scouring calf. Allow it to suckle freely. When this is not possible, feed the calf 10 percent of its body weight in milk divided into four to six feedings a day, and give electrolyte fluids in addition. The calf needs to replace the fluid loss and maintain energy.

Summary

The most effective treatment for scouring calves is administration of fluids. Because affected calves may be weak and chilled, additional nursing care can be important. Providing warmth, dryness, and adequate nutritional and fluid support are critical.

Fluid therapy is most effective when given aggressively and early in the course of disease. Caught early, most calves will respond to oral fluid therapy. More severely affected calves (i.e., too weak to rise and very dehydrated) will require other routes of fluid administration, such as intravenous, in order to save their lives. Other treatments may be beneficial, but they are far less important than fluid and electrolyte replacement.

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