

# Calf scours

D. Hansen

**T**here are numerous causes of disease and death in newborn calves. In many locations, the leading causes of beef calf deaths are related to difficult birth (dystocia). After that, however, the most common calfhood problems are infectious diseases. Of these, scours, or diarrhea, is the most important single cause of calf sickness and death in the United States that occurs within the first several days of birth.

The effects of scours in an individual herd can be overwhelming. Almost no herd goes through a calving season without some scours. In severe outbreaks, illness can occur in 70 percent of calves born, and death can occur in 50 percent.

### Causes and effects of scours

Many factors influence the occurrence of diarrheal disease. Factors that predispose calves to scours include:

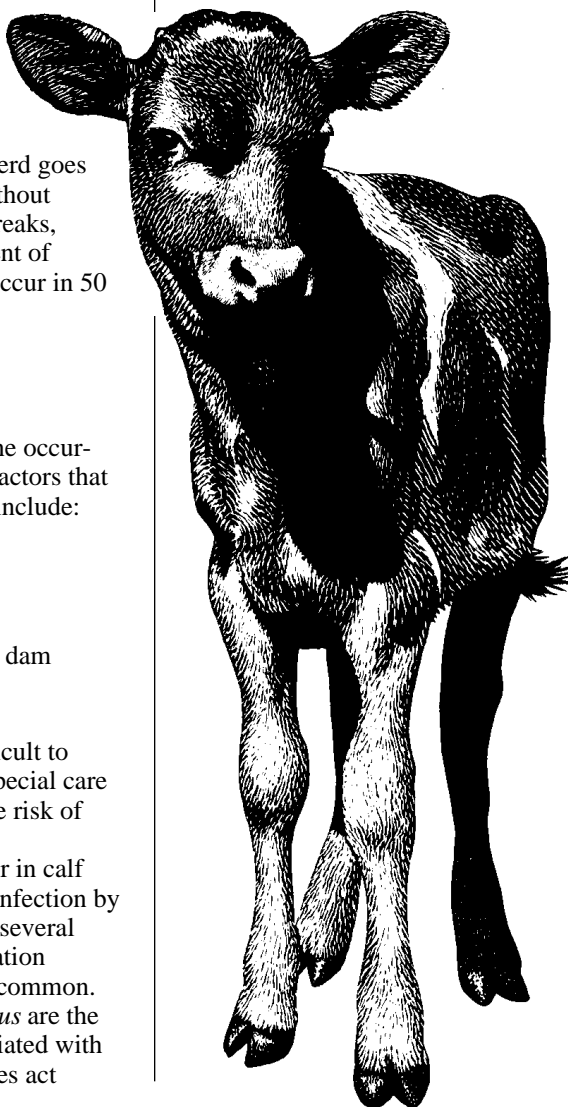
- dystocia
- poor nutrition of dam
- poor health of dam
- poor mothering ability of dam
- other factors

These factors can be difficult to control. When they occur, special care of the calf helps decrease the risk of later infections.

The most important factor in calf diarrhea is exposure to and infection by infectious agents. There are several types of agents. This publication discusses a few of the most common.

Rotavirus and corona virus are the most common viruses associated with calf scours. These two viruses act

similarly 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.)



*Cryptosporidia* is another major agent associated with calf scours. This coccidia-like organism 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 from severe fluid loss and pH imbalance. This agent can also infect humans and cause severe disease.

*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*, K99, does not invade the gut cells nor kill calves, but it causes enough damage to lining cells that large volumes of electrolytes and fluids are lost. Death can occur as with the other agents mentioned in this publication if infected calves do not receive supporting treatment.

Other types of *E. coli* can invade the gut cells and cause severe disease. In this case, the bacteria can spread through the bloodstream to any organ in the body, causing severe damage at these infected sites. *It is important to distinguish between K99 and these other types of E. Coli because treatment for one will not effectively treat the other.*

*Salmonella* bacteria are associated with calf scours and cause disease similar to *E. coli*. For example, they infect other organs as well as the gut. It is mentioned here because a sick calf with this bacteria is indistinguishable from calves sick with other agents and, like *Cryptosporidia*, *Salmonella* can infect humans and cause disease.

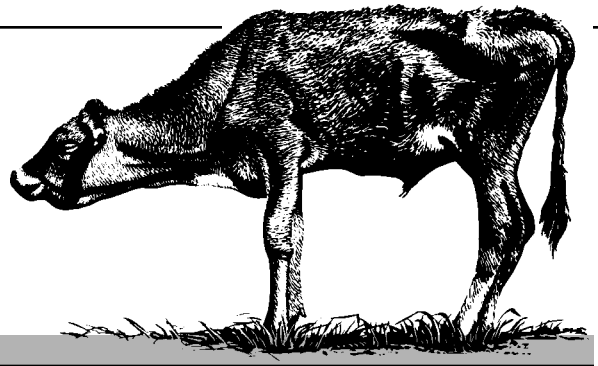
Don Hansen, Extension veterinarian,  
Oregon State University.



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Do not take calf scours 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 milk feeding. Known as nutritional scours, it results from fermentation of excess milk in the gut. The same problem can occur with calves fed certain types of milk replacer. Affected calves have loose stools but rarely become dehydrated and generally maintain good appetites. The common cause of nutritional scours is from feeding large quantities of milk at certain times with long intervals between feedings.

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 show dryness of mouth, loss of skin elasticity, sinking of the eyes into the eye sockets, and their extremities are usually colder than the body. The worse the dehydration and chemical imbalance, the more severely affected the calf is. More severely affected calves become depressed and weaker, may be unable to stand, lose their nursing reflex, and drop body temperature to subnormal levels. If they're not treated promptly and correctly, calves move into coma and shock. When losses are severe enough, affected calves 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 available commercially that rehydrate, correct pH imbalance, and replace lost electrolytes (potassium, sodium, chlorine, and bicarbonate). You should have a supply on hand to meet a scours problem before it occurs. *Consult with your veterinarian for product selection and volume of mixture to treat sick calves.*

In the early stages of diarrhea, calves are usually standing. Therefore, orally given products are 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 maintain normal body temperature.

Giving fluids too late or giving too little allows the progressive fluid loss to continue, and the calf's condition deteriorates. When dehydration and pH imbalance are severe enough, orally administered fluids are not well absorbed, and they do little to enhance the calf's survival. At this stage, the only way to prevent death is to give intravenous (IV) 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 recently. They also may act to absorb toxins and thus help clear toxins from the intestinal tract, but just how much help they are in doing so has also been questioned recently. These protectants are at least not harmful. On the other hand, numerous treatments have been tried that affect gut activity. These drugs decreased gut activity, and the assumption behind their use was that hyperactivity of the intestine was the cause of diarrhea. We now know that most agents causing diarrhea decrease, but activity and the use of these drugs is not necessary.

Antibiotics are commonly given by mouth to treat calf scours. *Researchers and veterinarians now believe the overall effect of oral antibiotics is detrimental to calves.* The common diarrhea agents mentioned here are either not affected by antibiotics or are highly resistant. The agents do not respond well to most antibiotics commercially available for oral use in calves. Furthermore, *K99*, *E. coli*, is routinely cleared by the calf as long as fluid therapy is provided to keep the calf alive. The bacteria that invade the gut

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lining and move into the bloodstream (*E. coli* and *Salmonella*) generally respond better to antibiotics given systemically (intramuscularly (IM), subcutaneously (SC), or IV).

Antibiotics given orally alter the normal population of organisms in the gut and sometimes predispose the calf 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, continuing to use antibiotics 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 *lactobacillus* or *streptococcus faecium* are commercially available. Studies of their effectiveness are continuing. It is likely they are useful in cases of prolonged diarrhea.

### Using fluids for scours

1. Most calves are acidic (acidotic) at the start of scours but may become basic (alkalotic) in a short time with continual use of some products. Consult your veterinarian to select products that prevent this switch in

pH balance from acidic to basic before starting and continuing treatment. The main goal of balancing electrolytes is to return a calf to near pH neutral.

2. Electrolytes mixed with milk often prevent curd formation and hasten the flow of feed through the calf. Therefore, decreased energy bearing nutrients can be absorbed by the calf. Never mix electrolytes with milk. Administer electrolytes in water 20 to 30 minutes after feeding milk to the calf.
3. Never mix half milk and half water. This practice prevents curd formation in the calf's stomach.
4. Never take milk away from a scouring calf. Feed 10 percent of the calf's body weight in milk divided into 4- or 6-times-a-day feedings. Also feed electrolytes in addition to milk. The goal is to replace fluid loss.
5. Feed electrolytes at full dose (6 to 8 pints per 100 lbs.) divided into 4 feedings for 1 to 2 days. Then cut the dose in half (3 to 4 pints per 100 lbs.) still feeding 4 times a day for 2 days. If diarrhea clears up, discontinue treatment.

### Summary

The most effective treatment for scouring calves is to administer fluids. Because affected calves may be weak and chilled, additional nursing care can be very 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 the disease. Caught early, most calves respond to oral fluid therapy. More severely affected calves, for example those too weak to rise and the very dehydrated, require other routes of fluid administration, such as intravenously, to save their life. Other treatments may be beneficial, but they are far less important than fluid and electrolyte replacement.

### For more information

Hansen, Don, *Prevention of Calf Scours*, Oregon State University Extension Service publication Extension Miscellaneous 8514 (Oregon State University, Corvallis, 1992).

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