

# Vet Call

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## Calves at greatest risk for diarrhea

Calves born to heifers are at greater risk for calf diarrhea (scours) than calves born to mature cows. The rates of dystocia, failure of passive transfer, starvation and death due to infectious disease are greater in calves born to heifers.

Because of this increased risk, observe heifers diligently during calving and for the first few weeks of lactation. Any indications of dystocia, nonacceptance of the calf, poor milk production or diarrhea should be identified, and steps to correct the situation should be initiated immediately.

Calves born with assistance should be evaluated immediately after birth. If the calf has a swollen tongue or jaw, or if the calf is unable to stand, the dam should be milked, and the fresh colostrum should be force-fed with an esophageal feeder.

If the dam has an inadequate amount of colostrum, frozen colostrum stockpiled for this purpose should be thawed slowly, warmed to body temperature and administered by esophageal feeder. An 80-pound (lb.) calf should consume 2 quarts as soon after birth as possible.

Calves born in an unsanitary environment should be dried, warmed if needed, observed to verify colostrum intake and moved to the best (least muddy) site available.

During periods of heavy rain or snow, every effort should be made to prevent the cow herd from congregating in small areas. If bedding is used, spread adequate amounts in several locations over a wide area to decrease the concentration of animals in any one site. Cattle congregated in small areas, especially during inclement weather, will create extremely muddy environments in which germs are spread easily. And the risk of trampling newborns is increased greatly.

Calves born in low environmental temperatures should be observed closely for evidence of proper maternal care. If the dam does not place the calf in an appropriate location and lick it dry shortly after birth, intervention is needed.

In extreme situations, all calves born during a cold snap may need to be dried and warmed under a heat lamp or warm-air blower before being turned outside. Protection from the wind is critical during periods of low environmental temperatures. Natural windbreaks, such as hills, cutaways and timber, often are sufficient. If natural protection is lacking, man-made windbreaks should be constructed that supply enough protection for all cattle in the pasture.

### The cause

Scours is due to inadequate antibody transfer via colostrum or overwhelming challenge with bacterial, viral or protozoal pathogens (germs) due to muddy conditions and crowding. The most common pathogens that cause diarrhea are enterotoxigenic *E. coli*, rotavirus, coronavirus, cryptosporidium and various *Salmonella* species. All of these germs are present on most, if not all, farms.

Scours treatment consists of nursing care (keeping the calf warm and dry), fluid replacement [oral or intravenous (IV)], correction of acidosis and antibiotic administration.

### Fluid therapy

Many cases of scours respond to administration of oral fluids (water and electrolytes). If necessary, calves can be held off milk for 12 hours and maintained on oral electrolyte solutions alone. Calves should not be held off milk for more than 24 hours.

The fluid maintenance needs for most calves is 3-4 quarts/day. Dehydrated calves should receive the maintenance requirement plus the volume necessary for rehydration. To calculate rehydration requirements, the calf's weight in kilograms is multiplied by the estimated dehydration percentage.

### Acidosis

Both diarrhea and dehydration can lead to acidosis (low blood pH). Treatment for acidosis involves IV or oral fluid replacement and alkalization (giving substances that raise pH, such as bicarbonate or citrate). For calves that are 8% or more dehydrated, IV fluids are indicated, and bicarbonate should be added to correct acidosis.

If calves are less than 8% dehydrated, fluid therapy should be given orally. Sodium

#### Fluid maintenance needs for 24 hours for a 75-lb. (34-kg) calf:

$34 \text{ kg} \times 100 \text{ mL/kg} = 3,400 \text{ mL} = 3.4 \text{ liters} = 3.6 \text{ quarts}$

#### Fluid replacement for a 75-lb. (34-kg) calf that is 8% (0.08) dehydrated:

$34 \text{ kg} \times 0.08 = 2.72 \text{ liters} = 2.88 \text{ quarts}$

Therefore, total fluids needed for a 75-lb. calf that is 8% dehydrated is about 6.5 quarts for the first 24 hours, with 3,400 mL (3.6 quarts) needed daily after that. Intravenous (IV) fluids should be given slowly during the first four hours in severely depressed calves, then the rest of the 24-hour requirement is given over the next 20 hours.

#### To estimate dehydration percentage, use the following guidelines:

< 5%	Eyelid skin pinch snaps back immediately, eyes normal
5%-8%	Eyelid skin pinch slowly releases, eyes minimally sunk, gums are moist and warm
8%-10%	Eyelid skin pinch persists, eyes noticeably sunk, gums are warm and sticky
10%-15%	Eyelid skin pinch persists, eyes very sunk, gums are cold and dry

#### Oral fluid solution ingredients:

- Glucose or glycine — co-transport of ions, plus energy source. High-glucose concentrations will cause oral solutions to be hypertonic (more concentrated than blood); in calves with gut damage due to viral diarrhea, hypertonic solutions should be used with caution
- Sodium, potassium and chloride — replacement of ions lost in diarrhea
- Citrate or acetate — absorption stimulation and alkalization (raise pH)
- Bicarbonate — alkalization (raise pH)

bicarbonate, to combat acidosis, can be given orally, but this has two negative results:

1. Stomach pH is increased, removing the gastric acid barrier, which is believed to decrease the number of pathogenic bacteria reaching the intestine; and
2. Milk needs an acid environment to clot, so when the stomach pH is raised, milk does not clot well, and diarrhea is prolonged.

Therefore, if calves are receiving milk, bicarbonate should not be used in the oral solution. Milk and bicarbonate-containing fluid can be given on alternate feedings separated by at least 3-4 hours. Citrate added to oral rehydrating solutions has alkalizing activity without increasing stomach pH and can be used with calves that are nursing or receiving milk replacer.

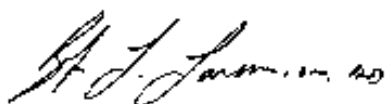
The composition of an oral rehydration solution should be based on the fluid and electrolyte losses. The goal is to provide agents in the maximum quantities possible without overwhelming the bowel and potentially aggravating the diarrhea.

### **Antibiotic therapy**

Antibiotic therapy should be appropriate for the pathogen and disease process being treated. Among the diarrhea-causing agents, only *E. coli* and the Salmonella species are bacterial and, therefore, possibly susceptible to antibiotics. The number of antimicrobial drugs that are effective and legally appropriate for bacterial scours is limited, so you should work with your veterinarian to select a proper therapy.

Antibiotics may be used in viral scours cases (coronavirus or rotavirus), even though these drugs do not kill viruses. Antibiotics are appropriate in these cases because the viruses damage the gut wall, making it easier for normal bacteria in the gut to escape into the blood stream, and antibiotics may provide some protection.

Scours is a common problem in young calves, particularly in adverse weather conditions. If you are dealing with a scours problem, the treatment strategy always should include good nursing care, fluid replacement and correction of acidosis. Sometimes it will include appropriate antibiotic therapy.



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