



Know the Organisms That Cause Scours

Nearly everyone raising calves has been faced with scouring calves. More than 1,800 farms in 28 states were surveyed and over half of the operations reported scours as the most common illness of calves. More than half of calf losses were caused by scours.

Scours is the calf's response to a metabolic upset or imbalance in the digestive tract. Disease-causing organisms that infect the intestine often destroy cells resulting in a release of cellular debris, proteins, acids and minerals into the intestine.

When enough intestinal damage is done, the mineral balance of the intestine is upset, and the calf responds by passing water into the intestine to reestablish equilibrium. The resulting combination of manure, water, mucous and occasional blood is called scours. In addition to water, there is a loss of the electrolytes sodium, chloride, potassium and bicarbonate which can cause acidosis (lowered blood pH) and death.

Scours may also be caused by toxins from infectious organisms or by incomplete digestion of nutrients. Poor-quality protein, fat or carbohydrates in milk replacers or a change in concentration of components (such as switching from whole milk to transition milk) can cause scours.

Infectious scours most serious ...

Scours caused by one or more infectious organisms are most common and most serious. Besides the possible loss of the calf, the cost of treatments (electrolytes, antibiotics, etc.) and labor are high.

A number of organisms can cause scours; the age distribution of the most common is shown. It is important to be able to identify the organism causing disease in your calves.

Salmonella: Several species of the bacterium, *Salmonella*, can cause scours. But the most common is *S. typhimurium*. *Salmonella* causes scours in calves as early as 4 days, although it most commonly affects calves between 1 and 4 weeks.

The primary sources of infection are contaminated feed and infected animals on the farm. An outbreak of *Salmonella* can be devastating. Sanitation of facilities and isolation of calves are the best prevention against *Salmonella*.

Because *Salmonella* generally affects calves less than 4 weeks of age, the amount of colostrum calves get can influence their resistance. There also are vaccines that are effective against *Salmonella*, as are some antibiotics. *Salmonella* can be transmitted to people, so calf raisers must be careful. Separate sick calves from others, and take special care when working with them.

The National Dairy Heifer Evaluation Project sampled calves throughout the U.S. and found the greatest prevalence of *Salmonella* in the southeast (3.4 percent of samples) and lowest prevalence in the northeast (1.5 percent). *Salmonella* incidence also varied by season, with greatest prevalence in late summer and fall (3.6 percent) and lowest in late winter (1.2 percent). It should be noted that prevalence data reported by the USDA relates to prevalence of infection and not necessarily illness. Some calves may carry the organism but not show signs of disease.

Age also plays a role. The greatest prevalence of *Salmonella* occurred during the first week of life (5.5 percent of samples were positive) and declined thereafter. By 4 weeks of age, only 1.2 percent of samples were positive. Clearly, *Salmonella* strikes calves quickly, so youngest calves are at the greatest risk. However, *Salmonella* also can be found in older cattle...older animals often serve as a source of organisms on the farm. Coccidia infect the calf through ingestion of bedding or manure containing oocysts (eggs), so sanitation and isolation are critical. Housing calves in hutches is particularly effective. Upon ingestion, coccidial oocysts multiply inside intestinal cells, causing damage to the intestinal wall.

Escherichia coli: There are two distinct disease conditions caused by the bacteria *E. coli* ... septicemia and enterotoxemia.

Septicemia (bacteria in the blood) caused by *E. coli* occurs when the calf does not consume colostrum before the bacteria reach the small intestine. Disease occurs quickly ... usually calves show signs of diarrhea, depression or coma and die within 24 to 36 hours of birth. This type of *E. coli* infection can be avoided by early feeding of colostrum (within the first hour of birth if possible) and by providing clean, dry calving areas.

Enterotoxemia (bacterial toxins in the intestine) caused by *E. coli* occurs when bacteria attach to the intestinal wall of the calf (usually within the first seven days) and proliferate. The bacteria produce a toxin that causes the calf to move water into the intestine to "flush out" the toxin and bacteria. The diarrhea produced by *E. coli* is profuse, watery and may contain blood.

The best defenses against *E. coli* are sanitation of calving facilities and early colostrum feeding. Work with your vet to determine if any of the *E. coli* vaccines would be helpful.

Rotavirus: This virus causes scours in calves primarily from 1 to 2 weeks of age, although fecal samples may be positive to about 4 weeks of age.

Rotavirus infections usually cause mild to moderate scours, and most calves will recover. Rotavirus is widespread in the environment and resistant to many disinfectants.

You can minimize rotavirus scours by vaccinating cows during the dry period to provide antibodies against rotavirus in colostrum or vaccinate the calf shortly after birth. Isolation of calves and providing good ventilation also will help.

Coronavirus: Bovine coronavirus commonly causes scours in calves from 3 days to 3 weeks, although some calves may be affected up to 3 months of age. Scours caused by the virus are profuse and watery; dehydration and acid-base imbalances can occur quickly. Death loss is more likely when calves are infected with coronavirus than with other viruses.

Calves usually acquire coronavirus by eating contaminated bedding or manure, although there are reports of airborne transmission. Older calves and adult cows may harbor coronavirus and pass it to calves, so isolation of calves is important. Proper cleaning of feeding utensils also will help.

Coccidia: Scours caused by the coccidia *Eimeria bovis* and *Eimeria zuernii* usually occur after 4 weeks. Calves may be infected as early as the first week, but the incubation period is about three weeks, so signs of infection (diarrhea, often with blood) will not occur until then.

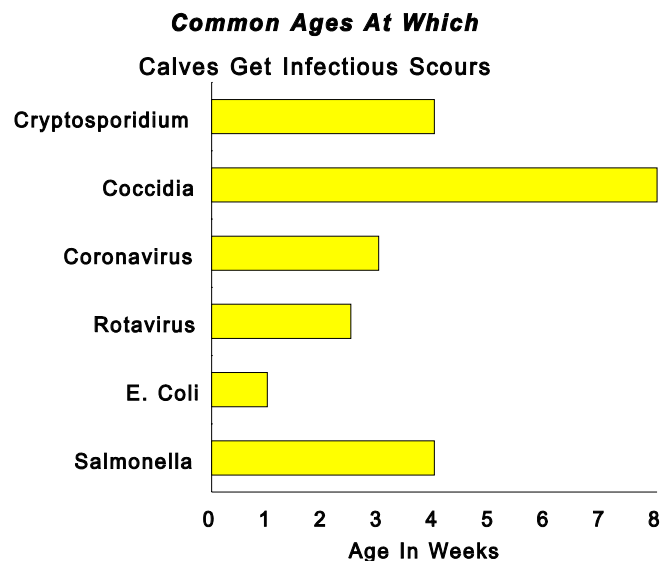
Several feed additives are effective against coccidia. They include decoquinate, lasalocid and monensin. It is important to note that damage to the intestinal wall is done before scours appear, so it is wise to use an anti-coccidial compound before calves begin to scour.

Cryptosporidium: This parasite causes scours in calves usually during the second and third weeks. It may be the most important organism causing scours. By the fourth week of life, the incidence of scours caused by *Cryptosporidium* declines as the calf develops immunity to the organism.

Currently, there is no approved treatment for *Cryptosporidium* in cattle, although the drug paromomycin recently has been shown to be effective. The best treatment is electrolyte therapy and patience... scours caused by *Cryptosporidium* will clear up in 5 to 10 days if there is no secondary infection.

Almost all herds are positive for *Cryptosporidium*, and about half of all calves from 1 to 3 weeks of age will be positive. The goal is to control or manage the pathogen.

There are other organisms that can cause scours in calves besides those listed here. This brief



overview of the most important ones may help you determine which organism (or organisms) are involved in your herd. One key to diagnosis is the age of the calf. However, in some cases, more than one organism is involved.

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Jim Quigley, Dairy Herd Management, Know the organisms that cause scours
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