

Vet Call

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Scours caused by viruses

Rotavirus and coronavirus are commonly identified as causing scours in calves less than 1 month of age. These viruses can cause diarrhea in calves when acting alone, but the severity is greater if the calves also are infected with other scour-causing organisms, such as cryptosporidium or enterotoxigenic *Escherichia coli* (*E. coli* K99).

Rotavirus most commonly affects calves that are 4-15 days of age, while coronavirus can affect slightly older calves (4-21 days of age). Both viruses are common, and blood tests have shown that 90% or more of adult cattle have been exposed to them. Adult cows, calves that have viral scours and calves that have been infected but are not scouring all can shed the virus in their feces and be sources of infection.

Rotavirus and coronavirus organisms primarily infect the cells lining the small intestine. The infected cells are destroyed, which decreases or prevents the calf from absorbing nutrients. This results in diarrhea, dehydration, loss of electrolytes (such as sodium, potassium and chloride) and acidosis.

The damage to intestinal cells occurs within 24 hours after infection, and after rotavirus infection it takes about four to six days for the damaged cells to be replaced with healthy cells. In contrast, the damage is more severe in coronavirus infections, and it takes a few days longer for a calf to replace the destroyed intestinal cells. Calves may require 21 days or longer to fully recover to a normal growth rate.

■ Protecting against the viruses

An important characteristic of rotavirus and coronavirus infection in newborn animals is that protection against disease is dependent on the presence of specific colostral antibody inside the intestine. Calves are not protected by antibody present in the bloodstream. Levels of protective antibody in milk are low, even if the dam's blood levels of antibody are high.

Protection from suckling lasts only as long as colostrum is being produced, which explains why viral diarrhea commonly

occurs after 4 days of age. This age coincides with the marked drop in colostral production by the third day after calving, followed by about a period of 18-24 hours between infection and the first signs of disease. Of course, calves that receive little colostrum are susceptible to viral scours before they reach 4 days of age.

In the absence of complications, recovery from viral scours usually occurs with fluid therapy and nursing care (warm, dry and comfortable) in two to five days, which parallels the replacement of the intestinal cells. Oral fluid replacement is adequate for mild to moderate cases of scours; however, intravenous (into the vein) fluid therapy is essential if the calf is severely dehydrated or depressed.

When possible, affected calves should be isolated from calving grounds and other newborn calves. When outbreaks occur, the principles of good sanitation and hygiene should be emphasized to minimize the spread of infection.

To prevent viral scours, the management of pregnant animals at the time of calving must ensure the degree of exposure of the newborn to diarrhea-causing viruses is minimized. Sanitation, hygiene and population-density control to avoid overcrowding, are important. The ingestion of adequate quantities of colostrum soon after birth also is important.

■ Vaccinating may not work

Vaccinating the newborn calf with an oral vaccine has not been shown to prevent viral scours. This probably is because the product works primarily to increase blood levels of antibody rather than to increase antibody levels inside the intestine.

The success of vaccinating the dam to provide protection to the calf through the colostrum and milk is doubtful. Remember, most adult cattle have been exposed to rotavirus and coronavirus; therefore, they already are producing antibody protection to be delivered through the colostrum. The problem is that the antibody levels decrease to low, unprotective concentrations during

the transition from colostrum to milk.

Vaccination of the pregnant dam before calving with a rotavirus and coronavirus vaccine may increase the level and duration of specific antibody in the colostrum. However, the challenge is to develop a vaccine that will result in protective levels of specific antibody to rotavirus and coronavirus in the milk for a sufficient period (such as 10 days to three weeks) to protect calves during the entire period they are most susceptible to viral diarrhea.

Field trials have shown that even milk from cows that have high amounts of colostral antibody at calving is deficient five to six days later.

■ Improving the odds

The most scientifically sound method to improve the percentage of calves that survive to weaning does not rely on vaccines or antibiotics. A cost-effective nutrition program ensuring heifers and cows receive adequate energy and protein before calving, as well as a strategy to increase calf vigor and to decrease the interval from birth to suckling by decreasing the incidence of dystocia, are integral components of a calf-health plan.

The calving area should be free of mud and should be protected from the wind. The ability to dry and to warm calves that have been born during inclement weather becomes critical for high survival rates during snowstorms or rainstorms accompanied by low temperatures.

Calves in each nursery pasture should be about the same age (within 2 weeks of age). By having several nursery pastures in which calves can be grouped by age, young calves are not exposed to older calves that are more likely to be shedding germs that cause diarrhea. Calves that develop diarrhea should be moved immediately to an area away from healthy calves and treated.

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