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Calf Note #21 – Feeding Scouring Calves

Introduction. Scouring calves are a common occurrence on many dairy farms. Scours are caused by several factors, the most common of which are infectious organisms such as coccidia, *Cryptosporidium*, *Salmonella*, rotavirus, and others. During infectious scours, calves lose considerable water and electrolytes - minerals such as sodium, phosphorous, potassium, chloride and others. Our goals when dealing with scouring calves are threefold - first, to replace the water and electrolytes they are losing, second, to kill the organism causing the infection (if possible), and finally, to minimize the chance that any "opportunistic" organisms may cause a secondary infection while the calf's immune system is depressed.

Now, a disclaimer... Treating scours is serious business. Although they occur commonly, they can and often do kill calves. It is important that you work closely with your veterinarian to identify the cause of the scours and develop a long-term program of sanitation, biosecurity, and management to minimize the incidence of scours in the herd.

What are scours? Scours, or diarrhea, is defined as an increased frequency, fluidity or volume of fecal excretion. There are several ways that scours can occur:

- *osmotic* - caused by excessive osmotic pressure in the intestine. This is often caused by undigested feed reaching the large intestine where it may be fermented. Increased osmotic pressure causes water to move into the intestine to re-establish osmotic homeostasis.
- *malabsorption* - caused by intestinal damage caused by several organisms - e.g., coccidia. When the intestine is damaged, nutrients can't be absorbed and can build up, causing osmotic upsets.
- *secretory* - caused by toxins produced by organisms. The calf tries to "flush" toxins out of the intestine by moving large amounts of water from other areas of the body. The toxin produced by *E. coli* is an example.
- *impaired motility* - excessive contractions of the intestine, increasing movement of material through the intestine.

It is not possible to definitively determine the infectious organism by looking at the color, consistency, or odor of the feces. A definitive identification requires a sample for microbiological analysis. It is best to work with your veterinarian to identify the causative organism.

A traditional and common way of feeding scouring calves is to remove all milk or milk replacer for a couple of days and replace the milk replacer with electrolytes. The idea is "to starve the bugs" and improve the calf's condition. By removing milk, the theory goes, it is possible to allow more rapid regeneration of intestinal tissues, reduced growth of bacteria, and reduced osmotic diarrhea caused by fermentation of milk in the intestine. Unfortunately, at the same time, you're starving the calf. Because the calf requires energy and protein to help fight off the infection, this method of treating

has serious disadvantages. Researchers at the University of Illinois reported the results of an excellent study in a 1994 issue of the Journal of Dairy Science. Calves that developed scours were fed one of three treatments. In the "traditional" method, calves were fed electrolytes and no milk for 2 days, followed by gradual re-introduction of milk. The other group was fed whole milk plus electrolytes. Calves that were fed milk plus electrolytes did not lose body weight whereas calves that were not fed milk lost body weight for the first 3 days. As the authors said in their article, "*Maintenance of calves on a full diet of milk plus an amount of [electrolytes] equal to or greater than the estimated amount of fluid lost in feces seems to be the method of choice for supportive therapy of [scouring] calves.*"

It is important to note that scouring calves were treated immediately in the Illinois study. That is a key point. Early intervention is important to be sure that you can provide enough electrolytes to replace the liquids the calf is losing. You can lose calves quickly, so early fluid therapy is essential. The best calf raisers can spot a calf at the earliest stages of scours. That's the time to intervene.

At the APC Calf Research Unit (and previously at the University of Tennessee), we generally look at each calf twice daily for any sign of disease. When a calf begins to develop scours, we will begin feeding 2 liters of commercial electrolytes at "lunch", which an additional feeding offered at approximately 12:00 noon. We keep calves on milk replacer (fed at 8:00 a.m. and 4:30 p.m.). By offering an additional feeding, calves will consume an extra 2 liters of fluid which is very important when they're losing water. If calves are severely dehydrated, we will offer an additional feeding of electrolytes at about 6:00 p.m. We also work closely with our vet to determine when to begin IV electrolyte therapy if necessary. Because calves can lose large amounts of water, we don't hesitate to offer an additional 4 liters of electrolytes per day to scouring calves. That's in addition to the 4 liters of milk replacer and ad libitum water.

Feeding scouring calves is a challenge. Many times, the loss of fluid and ions can cause a calf to die very quickly. Learn to spot the signs of infection and act early with supportive therapy.