



Fluid Therapy:

Part 3 of a 3 part series

Bethany Lovaas, DVM, University of Minnesota Beef Team

Cattle are not the most efficient species at absorbing water from ingested material. This is evidenced by the character and consistency of their normal fecal material. In comparison to any other species (horses, small ruminants, dogs, cats, etc), cattle tend to have much more fluid feces. A cow or calf with horse-like fecal material has been experiencing a high level of dehydration for a significant amount of time.

Dehydration is an often overlooked clinical sign of a sick animal. A sick cow or calf often is not feeling well enough to eat or drink. Depending on the environmental conditions and the cause of disease, dehydration may be mild to severe and life-threatening. A calf with pneumonia likely is experiencing some level of dehydration, but this would be mild compared to the dehydration of calf scours. Also, a lame animal that has been lying in the heat of the day, is likely to be significantly dehydrated.

Therapy for dehydration varies with the cause. A lame cow that hasn't made it to the water source for a while can be treated with a variety of electrolyte solutions. However, a beast with scours will require more specific therapy due to losses of specific electrolytes, in addition to significant water loss.

The place and time where fluid therapy can pay off the most is in neonatal calf scours. Finding an effective anti-infective to treat calf scours isn't going to save calves. More often than not, it's not the infection that kills the calf, but

the acidosis and hypovolemia (low blood volume) from dehydration that results in calf mortality (death). Most producers are not nearly aggressive enough with fluid therapy in scouring calves. Tube feeding once or twice a day with an electrolyte solution isn't nearly sufficient. So, how much fluid should a scouring calf receive in 24 hours? Let's have a look.

Let's say you've got a 100 lb (50 kg) calf with coccidiosis. The calf is listless, depressed, its eyes are sunk in, and it has a skin tent, in other words, when the skin is pulled away from the neck, it does not snap down quickly, as it normally would. We would guess that this calf is about 10% dehydrated. At 50 kg (100 lbs) of body weight, and 10% dehydration, this calf will require 5 liters of fluid just to replace its current deficit. The calf will also need about 2.5 to 5 liters of fluid a day for normal maintenance, and then there are the current losses (scours) that have to be accounted for. So, all told, a scouring calf that is 10% dehydrated will need approximately 8-11 liters of fluids in the first 24 hours of therapy! This calf should be tube fed 4-5 times, instead of the typical 2 times. It is important to remember that a calf stomach, on average, can hold up to 2.3 gallons, so if you are operating under a tight schedule, you may be able to tube the calf 3 times a day at 3 liters per feeding.

It is also important to note whether or not the calf is still nursing. A calf that is 10% dehydrated is not likely to be eating, but one that is eating will be meeting some

of its fluid requirements through the cow's milk. Also, if you have to tube feed a calf milk replacer, because it's not eating, it is a good idea to wait 2 hours before you tube feed any electrolyte solution (the bicarb in the electrolyte solution will disrupt clotting and normal digestion of milk in the calf's stomach).

When a calf has scours, it is also losing its body's store of bicarbonate. Bicarbonate is the body's "buffer", in other words, bicarb is responsible for maintaining normal blood pH. If a large enough quantity is lost, the calf's blood pH will drop (acidemia). There are several compensatory mechanisms built into the calf's body for dealing with a finite level of acidemia, but when the system is overwhelmed, the calf dies from heart failure. Therefore, when choosing an electrolyte product for treating a scouring calf, it is VERY important that there is bicarbonate in the electrolyte solution. Read the ingredients on the label, and look for some form of bicarbonate. You can also mix up your own electrolyte solution with baking soda and corn syrup. This solution won't have all of the other necessary electrolytes that a branded solution would have, but it works well in a pinch.

Another important electrolyte that is lost with scours is potassium. Loss of potassium occurs during compensation for acidemia, and a low potassium level (hypokalemia) is the cause of heart failure in scouring calves. Therefore, it is a good idea to supplement potassium, if possible, to scouring calves.

The toughest part about treating scouring calves is catching them. Often it requires at least two people to handle a scouring calf if it is healthy enough to nurse. A good handling facility will aid significantly in the success of a fluid therapy program. There are many interesting derivations on the calf catching theme. Some devices attach to four-wheelers, others to small tractors, still others that attach to the loader arms of the tractor, and some are the four legged kind with the aid of a rope. Whatever the method for catching sick calves, it is important to make an attempt to reduce or minimize the level of stress that the calf experiences. There are many anecdotal accounts of calves dropping dead in a matter of seconds to minutes after treatment

For more information on this topic, please contact the University of Minnesota Beef Team at www.extension.umn.edu/beef