

# Fight Back with Fluids

## Fluid therapy is the best defense against diarrhea losses.

by Brooke Byrd

In herds with diarrhea problems, treatment should begin even before a diagnosis can be made, says Ohio State University Extension veterinarian Bill Shulaw. Regardless of the cause, “maintaining hydration is crucial, because usually it’s dehydration and electrolyte loss that are at the root of the illness,” he explains.

“That’s where fluid therapy comes in,” he continues. “There’s hardly a time that fluid therapy isn’t indicated, whenever you have a diarrhea problem.”

### Determining dehydration

The first step in fluid therapy is determining the appropriate patient. Bob Larson, Kansas State University professor of production medicine, offers tips for determining a calf’s dehydration level and if fluids are necessary.

“As calves become dehydrated, they become depressed — not as active as other calves their age,” he says. “An extremely dehydrated calf is even comatose. It doesn’t respond to stimulus at all.”

While a calf’s ears may droop as a sign of depression, Larson cautions that it can’t always be linked to depression caused by diarrhea. “An animal could have normal fluid levels and still be depressed — just not feeling well due to other causes.”

Similarly, scouring calves that are still very alert, active and difficult to catch don’t fit Larson’s recommendations for fluid treatment.

“An animal that is really acting vigorous and healthy is not necessarily a good candidate for treatment,” he says. The stress from catching calves and giving fluids could conceivably cause more problems than it helps.

Another method of determining dehydration is to look for the skin’s ability to snap back into place. “If I can take the skin and pinch it up and it snaps right back into place, that’s a good sign,” Larson says. However, if the skin stays in a pinched-up or tented position and only slowly returns to normal, that’s a sign of dehydration.

“The more dehydrated an animal is, the slower that tenting or pinching response goes back to normal,” he explains. An animal that is depressed, whose eyes are sunken

back into its head, and whose skin doesn’t snap back after being tented is definitely dehydrated, Larson says. “I’m going to try to get some extra fluids into him.”

### Stepping in

Larson separates dehydration into three main categories: mild, serious and severe. A mildly affected calf, he explains, is one that is slightly dehydrated and scouring, but still able to stand and run, or at least able to sit up on its chest and respond to anyone approaching.

“I’d treat them in the pasture with oral fluids, then turn them back out with their mothers,” he explains. “Usually, if we can get some extra fluids in those calves, they will do fine.”

While some calves will take fluids from a bottle, tube-feeding is the most common method, Larson says. He cautions that rough handling while tubing may damage a calf’s esophagus, but “with careful handling, those tube feeders work pretty well.”

A more seriously affected calf — depressed and dehydrated, but able to sit up on its chest — may require more attention. “We may bring him in closer where we can handle him, maybe several times over the next couple of days, with oral fluids,” Larson says.

“As animals become more severely affected, you have to get more aggressive with your treatment,” he notes. “A calf that is laying out on its side, either unwilling or unable to sit up on its chest, that’s the type of



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calf I’m going to use IV (intravenous) fluids with.”

The severely affected calf also needs to be brought to a facility or veterinary clinic where it can be kept warm and dry, and given IV fluids by a professional. Larson emphasizes the importance of good nursing care with all dehydrated and sick calves. “Keep them warm, fed and dry,” he says.

### Recipe for success

The key ingredient in giving fluids is water, Larson notes. In addition, many dehydrated calves are also acidotic. “In other words, their pH is lower than it ought to be, so we’ll give something that will raise their pH,” he says. The treatment will also contain salts and minerals the body uses every day and that can be lost in diarrhea or other illnesses.

While producers can make their own recipes with common kitchen ingredients (see “Raiding the kitchen”), Larson says many people prefer commercial electrolyte solutions. “They’re easy to store; they come in a pouch. Put several of them in the cabin of the truck. They’re really easy to carry around.”

**Table 1: Dehydration percentage based on physical symptoms**

Percentage	Symptoms
<5	Skin pinch snaps back immediately, eyes normal
5-8	Skin pinch slowly releases, eyes minimally sunken, gums moist
8-10	Skin pinch persists, eyes noticeably sunken, gums warm and sticky
10-15	Skin pinch persists, eyes very sunken, gums cold and dry

To determine how much fluid to give, Larson sits down with a pen and paper to determine how much the calf is dehydrated, then aims to replace that much fluid. A calf's fluid maintenance needs (how much fluid the calf would normally receive each day) can be figured as 50-100 milliliters (mL) per kilogram (kg) of calf weight [1 pound (lb.) = approximately 0.45 kg] per 24 hours. For most calves, he says, 3-4 quarts a day fulfills fluid-maintenance needs.

However, Larson says, "For dehydrated calves, the calf should receive the maintenance requirement *in addition* to replacing the volume necessary for rehydration." To calculate rehydration requirements, multiply the calf's weight in kilograms by the estimated dehydration percentage (see Table 1).

For example, a 75-lb. calf (34 kg) will require 1,700 to 3,400 mL for fluid maintenance, plus an additional 272 mL for rehydration, across a 24-hour period. Usually, Larson notes, giving that much fluid happens four to six hours apart, "depending on that calf's attitude and overall response to the treatment."

### Treating the trouble

To determine whether repeated treatments are necessary, Larson says, "I'm

going to use how much I thought they were dehydrated in the first place and how the calf is responding to my intervention.

"In the best-case scenario, with a fair number of calves, one treatment really seems to get them over the hump," he continues. "More severely affected animals will need increasing treatments." For calves that require longer-term treatments, he says, "The success rate of getting those calves back into healthy condition is a lot less."

Larson also emphasizes that calves, especially younger calves, continue to receive milk. "Milk is an excellent source of energy, and the calf really responds well to that. Unless a calf is severely affected, I'd try to keep some of his fluid intake being his mother's milk."

For very young calves, colostrum is crucial, he explains. "Easier said than done, I realize, but whenever possible, when you've got a young calf, catch the cow, milk her out, and use that milk to make sure the calf gets colostrum."

### Prevention works

"Really emphasize cleanliness," Larson says. "Cleanliness is something we repeat all the time." For those producers calving in the springtime, it may be especially difficult due to mud, but Larson says cleaning is crucial

to minimizing the spread of germs around the farm.

"Your tube feeders, the buckets that you mix things in, all those things — you should do a good job of cleaning them between calves." Any utensils, especially those put in a calf's mouth, are potential troublemakers.

"Keep the environment that the calves are in very clean," Larson emphasizes.



### Raiding the kitchen

Kansas State University professor of production medicine Bob Larson offers the following recipes producers can make from materials in their own kitchens for fluid replacement therapy.

**Isotonic sodium bicarbonate.** To each liter (L) of distilled water, add 13 grams (g) clean baking soda. This is often used to combat acidosis.

**5% dextrose solution.** To each L of distilled water, add 110 milliliters (mL) of sterile 50%-dextrose solution. This must be purchased from a veterinarian.

**Isotonic (0.9%) saline solution.** To each L of distilled water, add 9 g (7 cc) of clean, non-iodized table salt.