



Calf Management Research Management of the Dehydrated Calf

The dairy producer and calf raiser are often faced with the challenge of dehydrated calves. The small neonate is very prone to dehydration due to scours, transportation stress, heat stress, or other stress factors. Previous management strategies have recommended removing milk from the scouring calf and feed only electrolytes. However, more recent research and field experiences indicate that milk or milk replacer (MR) should continue to be fed to the scouring calf, with electrolytes fed an hour or so before or after feeding milk. In these scouring cases, electrolytes may be fed 3 or 4 times daily. There are extreme cases of calf scours that are so severe that milk or MR should be removed and only electrolytes fed. These are the extreme cases where the manure is watery with the appearance of little solids.

Research in the area of rehydration techniques with oral supplements is difficult. The microbial challenge confounds the research of rehydration techniques. Research models use either, 1) healthy calves that are dosed with compounds to cause scouring in the absence of microbes or, 2) dehydrated calves from shipping stress. Both models have their strengths and weaknesses.

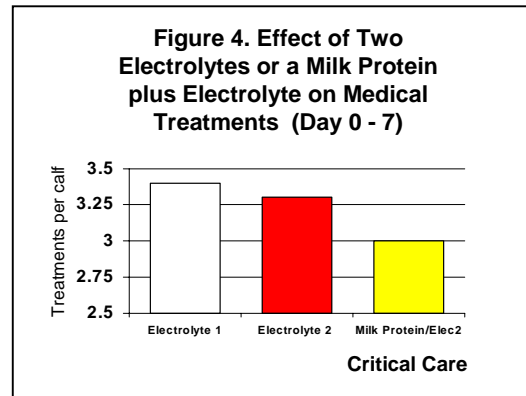
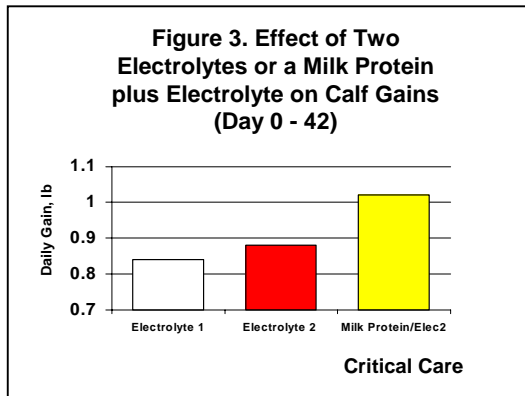
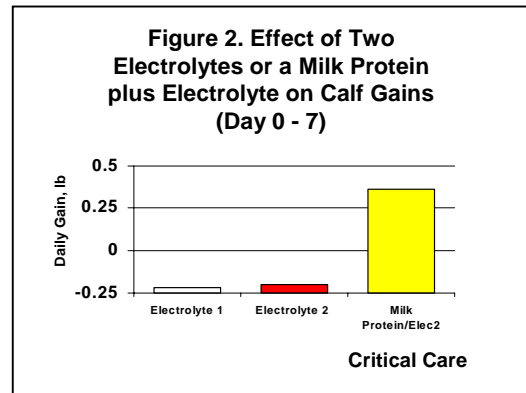
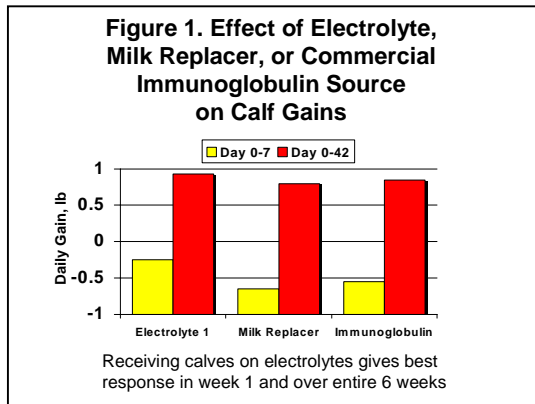
We undertook this research challenge and used shipped, stressed calves. Our initial trials evaluated three arrival management practices: 1) an electrolyte (Elec1), 2) a milk replacer, and 3) a commercial immunoglobulin source. Calves arrived in the evening and received their assigned treatment on arrival. Thereafter, a common starter and MR were fed. The data from 100 calves shown in Figure 1 reflected an improvement in calf gain for the Elec1 treatment over the other treatments. Calves receiving Elec1 had numerically fewer medical treatments during the first week of the trial than calves receiving the other two treatments.

Shipped in calves are dehydrated and often excrete more nitrogen (crude protein) in their feces and urine, plus they can be challenged with microbial scours at or soon after arrival. Electrolytes are formulated to promote absorption of specific nutrients from the intestines and osmotically pull water out of the gut into the tissues with the nutrients. Milk replacers contain lactose that tends to create a higher osmotic pressure within the intestines to hold water or even pull water into the gut. Milk replacers also contain high levels of fat that may not aid in digestion and absorption when the intestines become damaged from the microbial invasion. Thus, the results in the above trials were consistent with these principals. Both the milk replacer and the immunoglobulin source contained nutrients that would hold water or pull water into the intestines. In these trials the electrolyte was performing its function and supported the best calf performance.

In another trial, we evaluated three more arrival management practices: 1) an electrolyte (Elec1), 2) an second electrolyte formulated to create a lower osmotic pressure in the

intestine to pull water out of the gut (Elec2), or 3) a milk protein free of lactose that was combined with Elec2 (MP/Elec2). Calves arrived in the evening and received their assigned treatment on arrival. Thereafter, a common starter and MR were fed. Calves receiving MP/Elec2 gained faster during the first 7 days of the trial and over the entire 42 days than the calves fed Elec1 or Elec2 alone (Figure 2 and 3). Medical treatments during the first 7 days of the trial for the calves fed MP/Elec2 were less than for the calves fed the other two treatments (Figure 4). Of the 2 electrolyte-only treatments, Elec2 treatment was slightly better numerically than Elec1.

The milk protein plus electrolyte (MP/Elec2) supported better calf performance by providing key minerals (electrolytes) needed to rehydrate plus additional protein to support growth without providing other nutrients like lactose and fat that could have a negative effect on rehydration, digestion, or absorption in the stressed calf. MP/Elec2 has the potential to be used in newly received or stressed calves or calves that are suffering from microbial scours. Because it is lactose and fat free, it should not make some types of scours worse when milk replacer might.



This formulation of milk protein plus electrolyte (MP/Elec2) is available from Akey under the product name of **Critical Care**. **Critical Care** is fed at .5 lb diluted into 2 quarts of liquid (120° F water) by bottle or drenched to newly arrived calves. Offer free-choice, fresh, clean water. No other electrolyte, milk, or milk replacer should be fed upon arrival. Begin feeding milk or milk replacer 10 to 12 hours later.