

Hot Weather and Hydration

Wendy Krebs, DVM

Hot summer weather has definitely arrived. With it comes increased risk of dehydration not only to yourself, but to your horse as well. Dehydration and electrolyte imbalances can lead to colic, kidney problems, irregular heart beat, laminitis and other problems, so it's important to keep your horse hydrated to avoid these sequelae. In some ways, it is remarkable how resilient horses are to the negative effects of dehydration. This is because horses have the benefit of a fluid reserve in their intestinal contents. It is estimated, for example, that a horse carries up to 90 liters of water mixed in with the digesting hay in their large intestine. This is both a blessing and a curse, because while it provides an emergency fluid source to keep the blood volume normalized despite fluid losses, the intestinal contents are thereby dehydrated, which leads to intestinal impactions. Electrolyte depletion combined with fluid depletion can also lead to ileus, which is decreased intestinal motility that can result in severe small intestinal distention and colic.

Fluid and Electrolyte Losses

Horses perspire copiously during exercise, and can have losses of as much as 15-20 liters (1 liter = 0.26 gal) per hour during hot weather. One study of endurance horses shows that by the 25 mile mark, they lost an average of 19 liters, and by the 50 mile mark they have lost 38 liters. Sweat consists of not only fluid, but also large amounts of sodium, chloride, and potassium. Therefore, to replace what is lost with sweat, horses need to consume fairly large quantities of both water and these electrolytes. Many horses are "good drinkers" and will consume water when it's offered both during and post-exercise. However, don't let this give you a false sense of security; it's important to note that horses do not become thirsty until they are approximately 2-5% dehydrated. And, at as little as 2% dehydration, active heat dissipation by exercising horses is decreased, so they will tend to overheat more readily, compounding their already compromised hydration status.

Degrees of Dehydration

How do you gauge your horse's level of hydration? As a general rule of thumb, a horse is considered mildly dehydrated when they are 5-6% dehydrated, and have lost 20-30 liters; moderately dehydrated at 7-9 % dehydration, and have lost 30-40 liters; and severely dehydrated at 9%, when they have lost >40 liters. Signs of mild dehydration are tacky (slightly dry) mucus membranes, and mild skin tenting when it is pinched. At moderate levels of dehydration, mucus membranes are dry, eyes are somewhat sunken, and horses act depressed. Severe hydration results in cold extremities, and recumbency (lying down, unwilling to move).

Prevention and Treatment of Dehydration

Pre-exercise

Results of several studies indicate that in high-temperature situations, horses that are hyperhydrated before competition outperform horses that are rehydrated either during or after the exercise. Horses will not voluntarily hyperhydrate themselves, but this effect can be achieved by administering electrolytes or plain salt pre-exercise. Increased blood levels of these electrolytes stimulate thirst, so horses essentially stock up on water before starting exercise. Pre-exercise electrolytes can be administered as a paste, or as a powder mixed in grain. In general, it is very

difficult to over do electrolyte supplementation. Horses will lose far more electrolytes via sweating than can be reasonable replaced by consumption.

Mid-exercise

During exercise, many horses will drink salty water preferentially since they are sodium-depleted, so it's a good idea to offer both plain water and water with 2 tablespoons salt per gallon. Consumption of salty water leads to better water retention than consumption of plain water. The next best option is administration of salt paste or electrolyte paste orally with a syringe. Offering salt blocks alone are better than nothing, but do not result in as much sodium consumption as salty water.

Post-exercise

Electrolyte supplementation is much less valuable once horses are depleted, so this scenario should be avoided if possible. Ironically, horses that are severely dehydrated do not absorb electrolytes well orally, as their gastrointestinal tract is partially shut down. Therefore, severely affected horses must be rehydrated with intravenous fluids. Horses with mild or moderate dehydration can still absorb electrolytes, so electrolyte paste given here is also helpful.

A commonly used protocol is to give a dose of electrolytes the night before strenuous exercise, a second dose in the morning before starting exercise, and a dose every 3-4 hours during exercise.

Take Home Message

As you enjoy your equestrian activities this summer, keep hydration and electrolytes in mind. As with most situations, prevention has been scientifically proven to be the best strategy. Prevention can be as simple as a few tubes of electrolyte paste or a box of salt kept in the trailer or the saddle bags, so that they're there when you need them.