

Pass the Salt, Please

Finally, summer is approaching! Forget about blanketing and breaking ice and begging farriers for borium. Short winter days give way to the long, lazy days of summer. Spring and summer represent the height of riding season, and with the delicious warmth of the days, nutritional strategies for a winning season must begin anew.

Horses have adapted well to demands placed on them by humans. Sweating allows horses to cool themselves after sustained bouts of exercise. For the most part, this mechanism works well. The exception may be in hot, humid weather, according to Kentucky Equine Research nutritionist and endurance enthusiast Kathleen Crandell.

“Endurance horses have the most problems in humid weather because the sweat does not evaporate, which delays cooling. Instead, the sweat stays wet on the coat. As long as horses are trotting or cantering, it is not a concern because the wind cools them. But, as the horses slow to a walk or stop, humidity can present major cooling problems because the wet coat acts as insulation, holding the heat in.”

The appearance of sweat, whether it is thin and watery or thick and foamy, is a sign the horse is losing fluids. Within those fluids, important body salts called electrolytes are escaping from the body at alarming rates. These salts are responsible for an extraordinary array of critical body processes: the pumping of the heart, the moving of ingesta through the gastrointestinal tract, and the filtering of wastes through the kidneys. On the cellular level, the salts control the fluid balance of the body by regulating movement of water in and out of cells. Without sufficient circulating electrolytes, horses may weaken, collapse, and in worst-case scenarios, die.

When exercised intensely in hot, humid weather, a horse may lose up to four gallons of sweat per hour. In that four gallons, a total of 30 teaspoons of body salts are lost. Horse sweat contains primarily sodium, chloride, and potassium, but other electrolytes, including magnesium and calcium, are also present in smaller amounts.

The concentration of electrolytes in the bloodstream and sweat is not identical. Horse sweat is considered hyperton-



ic, which means a greater concentration of electrolytes exists in sweat than in fluids circulating within the body. Human sweat, in contrast, is hypotonic, which means a higher concentration of electrolytes remains in the circulating fluids. This is why equine researchers have established their own protocols in supplying electrolytes to horses. In this regard, directly transferring human-medicine knowledge to the equine field proved incompatible.

Horsemen are sometimes unsure when electrolyte supplementation is appropriate. Supplementation is pertinent any time the horse experiences prolonged sweating or

repeated sweating day after day. While sweating is most frequently linked to exercise, electrolyte depletion can be the result of other, seemingly less stressful activities. Horses can sweat profusely when hauled long distances or when exposed to unusually high temperatures for extended periods. "This is particularly true when unseasonably warm weather occurs and horses still have their heavy winter coats," said Crandell.

The amount of supplementation varies with sweat loss. Electrolytes do not necessarily have to be replaced in the same ratio as they are lost. Imagine feeding a horse 30 teaspoons of salt!

"With regard to endurance horses, we generally try to replace about half of the estimated electrolyte losses from sweat. It is not uncommon to see a horse receive two ounces of electrolyte at the beginning and at every veterinary stopover during an endurance race in the heat. If the race is 50 miles, there would be about three stops, and a 100-mile race would have about six stops, which would equate to the horse receiving eight to fourteen ounces of electrolyte during the race. Dose rate averages out to about one ounce per hour, which is close to half of what a moderately exercised horse will lose in its sweat," said Crandell.

Extreme weather may boost supplementation, according to Crandell. "In extremely hot and humid weather, horses may require more electrolytes to support performance."

Commercial electrolytes are available, but horsemen should be careful in selecting a supplement. The first ingredient in many commercial electrolytes is not salt, but dextrose, a sugar. These supplements are most appropriate for horses recuperating from illness. To aid recovery from sweat-inducing exercise, horses should be given preparations containing salt (sodium and chloride) as the first ingredient.

Crandell advises paying careful attention to labels. "If a commercial electrolyte mix with more than 15% sugar is purchased, the consumer is basically paying for sugar—not electrolytes. What horsemen are trying to replace in the horse are electrolytes—not sugar. Of course, the horse may like the sugary electrolyte more because it is sweet, but it helps the horse little and it fools the rider into thinking the horse is being appropriately supplemented."

In addition to oral supplementation, measures to limit sweating following exercise can be taken to reduce the leaching of electrolytes from the bloodstream. If horses are worked heavily, sponging can reduce the need for sweating by quickly cooling the horse's body. Dousing liberally with water is 20% more efficient than air for removing heat from skin surfaces, though caution should be taken as to where the coat is soaked.

"The largest muscle group is found in the hindquarters so endurance horses are never sponged there with cold water because it can cause cramping. Sponging areas where

veins are close to the surface, like on the neck and on the legs, is best. Although the belly can be sponged, the back or croup should be avoided, too," commented Crandell.

Dehydration is simply the loss of body water through sweat or waste products. Under normal circumstances, horses replace water by drinking occasionally. When horses sweat profusely, such as during heavy exercise, they are unable to replace water losses quickly enough to maintain fluid balance. In the horse, dehydration is estimated as a loss of body weight. Losses of less than 5% (approximately 60 pounds for a 1,200-lb horse) are not likely to be detected.

A simple pinch test of the skin over the shoulder blade will quickly determine hydration status. If the skin is elastic and returns quickly to its original position, dehydration is not a problem. If, however, the skin is slow to rebound, dehydration has set in to some extent.

As fluids continue to be lost and dehydration advances, the heart rate will rise. Because there's less fluid in the blood, it becomes thicker and the heart must work harder to pump blood through the circulatory system. This excessive work by the heart induces fatigue in the horse and every effort should be made at this time to rehydrate the horse.

Dehydration - Why Won't He Drink?

In no instance is the adage "you can lead a horse to water, but you can't make it drink" more appropriate than with horses in a state of dehydration.

Like all mammals, horses have a thirst response, a physiological trigger that tells them when to drink. This mechanism keeps horses from becoming dehydrated in everyday situations, and is dependent, at least in part, on electrolyte balance. The thirst response is thought to hinge on sodium concentrations in the blood. In instances of light sweating, water is released, but the amount of electrolytes lost is minimal. The body recognizes this water loss and seeks to replace the deficit. In instances of heavy or prolonged sweating, however, water and salt are both lost, and the sodium concentration of blood may not rise appreciably. So, horses will not drink even though they are dehydrated.

Only hydrated horses should be given electrolyte supplements. Dosing severely dehydrated horses with electrolytes will likely transfer precious water from circulation to the gastrointestinal tract, thus compounding the dehydration. Before electrolytes can be given, horses must drink or receive liquids intravenously.

Despite this knowledge, some endurance riders give electrolytes to endurance horses that are mildly dehydrated. "These riders are always taking a gamble. The hope is that it will make horses thirsty, and most of the time it causes

it will make horses thirsty, and most of the time it causes them to drink. Of course, during an endurance race water is frequently available along the trail. Nevertheless, these riders always run the risk that electrolyte supplementation during dehydration may backfire and get their horses in trouble," said Crandell.

Researchers at Michigan State University researched the effects of offering salt water to horses following an 18- or 28-mile endurance test. For the first minutes following exercise, horses were offered plain water or salt water. The scientists discovered that the horses that consumed salt water actually had improved recovery of sweat fluid losses because they were more likely to drink later. When horses drank the salt water, the blood concentrations of salt

remained elevated and thus horses were more willing to drink again. Horses that drank plain water did not drink again following the first swallows despite being partially dehydrated because the water had diluted the blood and effectively switched off the thirst response.

What's the bottom line on electrolyte supplementation? If a horse sweats little, access to a generous amount of high-quality hay and a salt block will provide sufficient electrolytes. If the horse sweats profusely or is allowed only minimal forage, an electrolyte product containing sodium, chloride, and potassium is recommended.

Consistent supplementation with electrolytes may be just the thing to transform lackluster summertime performances into winning ones. ☺

Kentucky Equine Research has formulated a trio of electrolytes that support performance.

Summer Games Electrolyte is appropriate for general performance horses. Originally formulated for horses competing in the 1996 Olympic Games in Atlanta, this product is an electrolyte and trace mineral supplement that is added directly to concentrate meals.

Endura-Max is formulated for endurance horses. In addition to sodium, chloride, and potassium, Endura-Max also contains calcium and magnesium, two body salts often not available in commercial supplements. Endura-Max is a powder that can be mixed into the concentrate meal prior to or following a ride. Before a ride Endura-Max can be incorporated into an applesauce or yogurt base and placed in a syringe. This mixture can then be given quickly at checkpoints throughout a competition.

Endura-Max Plus is the only electrolyte paste formulated by Kentucky Equine Research. Endura-Max Plus features the same electrolyte formulation found in Endura-Max coupled with Neigh-Lox, a potent antacid designed to protect the stomach lining from the damaging effects of gastric acid during exercise.

Research conducted at the University of Florida showed that gastric ulcer formation might be connected to exercise. Researchers found that during exercise gastric acid splashed into the upper part of the stomach, an area not protected by mucous lining and therefore more vulnerable to damage. Left unresolved, gastric ulcers can significantly impair performance. Endura-Max Plus protects the stomach lining from gastric acid insult.

Summer Games Electrolyte, Endura-Max, and Endura-Max Plus are available through Kentucky Performance Products. Call 1-800-772-1988 to learn more about these electrolytes.





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