A high-speed review of hydration

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Originally published in Endurance News

Although it's always worthwhile to drill deep down into a subject and glean every last excruciating detail, let's face it, life sometimes gets in the way. Sometimes we don't want the full 18-course meal of a subject, we just want to pick our way through a quick review of the "pearls" that help us get down the trail a little happier and healthier.

As such, while some of the below tidbits might be new, and others a review, repetition is a good thing when it comes to optimizing hydration in the horse. Here's hoping the below gets just a few more swallows in when it counts this ride season.

1 On average, experienced endurance horses will finish a ride (at any distance from 25 to 100 miles) approximately 5% dehydrated, which, while still moderately compromised in certain ways, is within the tolerance level and qualifies as "fit to continue." For a 1000-lb. horse, 5% dehydrated equates to approximately 6.25 gallons of unreplaced fluid loss.

2 Dehydration cannot be quantitatively diagnosed by a single test or physical exam findings, although weight loss—as measured by a livestock scale—is our best single tool. More commonly, dehydration is diagnosed through a wide variety of parameters, including mucous membrane color and "tackiness," capillary refill time, heart rate and ability to recovery to resting levels within a few minutes, skin pinch, rectal temperature, jugular refill time and assessment of gut motility.

Blood analysis, if available, must also be extrapolated from the hematocrit (concentration of red blood cells within a sample), total protein and albumin.

3 Horses judged to be approximately 8% dehydrated or more are likely to be treated with aggressive IV therapy to replace the volume lost and replace electrolytes. The difference between 5% and tolerable fluid losses, and 8% requiring IV fluid therapy, is only an additional two to three gallons of onboard fluids.

4 The difference in fluid losses between 5% and tolerable, versus 12% and in imminent danger of death or life-threatening organ failure, is only about eight gallons of unreplaced fluid loss.

5 On average, under ambient conditions (meaning cool and dry), horses will lose 12 to 16 gallons of body fluid (mostly from sweat loss) during a 50-mile ride, of which they will only replace approximately eight to 11 gallons through voluntary drinking.

6 The first fluid be adversely affected through fluid loss during exercise is plasma, the watery portion of blood. As water is removed, the remaining blood becomes thicker, more concentrated and more difficult for the heart to pump efficiently (think of the comparative work involved to slurp iced tea through a straw versus a thick milkshake).

As a result, the heart rate is more likely to "hang" rather than dropping promptly down to recovery levels, and is a useful indicator that the horse's status is being adversely affected by fluid loss and progressing dehydration.

7 Of the average 80 gallons of fluid in the equine body, about two-thirds of it is kept inside cells, and is not immediately or rapidly available to be transported elsewhere in the body to offset sweat losses.

Of the average 26 gallons of fluid in the extracellular space (which includes blood, saliva, urine and fluids inside the GI tract), a loss of two to four gallons of unreplaced fluid equates to a 8% to 15% decrease in circulating fluids until they can be replaced, or until intracellular fluids can diffuse into the plasma volume.

8 The body starts to conserve fluid loss at as little as 2% dehydration (which is often very likely to occur at base camp, even before the start). One of the very first pathways to be restricted is saliva production. (Remember how the control judge is checking to see how moist the gums are?) With decreased saliva production comes a higher risk of an esophageal obstruction, or "choke," especially if the horse grabs a mouthful of dry hay throughout the day. As such, it is always a good idea to feed only wet food during and after the ride to reduce this risk.

It's considered bad manners to throw hay into the communal water troughs (it gets slimy and nasty within a few hours), but you can wet down your own hay supply, and only provide mash that is as wet and sloppy as possible. Never feed pellets that have not first been soaked down into a gruel.

Offering wet food at home on a regular basis makes it part of a familiar routine to your horse, and so more likely to be readily accepted at vet checks and base camp.

9 Even under perfect conditions, in a well-maintained trailer and considerate driver, horses will lose on average 0.8 gallons of fluid for every hour of travel, and will become 1% dehydrated for every 90 minutes of travel. As such, a fully hydrated horse traveling eight hours to base camp has lost over six gallons of fluid, and is approximately 5% dehydrated even before the start. Even with easy access to water overnight, many horses do ***not*** fully replenish themselves overnight for a variety of reasons, and so are often starting the ride with some degree of dehydration adversely affecting their performance.

10 Under extreme conditions, horses have been measured to lose four gallons of fluid in the form of sweat every hour. Therefore, a horse that did not replace transport losses the night before the ride, and then loses several gallons of unreplaced fluids in the early miles of a ride, can conceivably become 8% dehydrated (or more) and in significant metabolic trouble by the first or second vet check.

11 Right behind saliva production, the body will attempt to conserve fluids through decreasing sweat production. Paradoxically, this occurs even when ongoing exercise and ambient conditions are contributing to an ever-increasing thermal load that must be dissipated before damage and hyperthermia can occur.

This is why utilizing other strategies to help minimize heat accumulation are important. Clipping before a ride, braiding up heavy manes off the neck, sponging water onto the neck and shoulders when available, riding well within the horse's capabilities and getting off to spend some time on foot are all good ways to help maximize efficiency and minimize fluid loss.

12 Although not measured directly in horses, 3% dehydration in human athletes equates to 10% decrease in muscle strength (think of driving up a steep hill or through deep sand), and an 8% decrease in muscle speed (think having to quickly correct after a stumble through rocks).

13 Horses do not develop thirst to drive voluntary water intake as quickly as humans do, and do so for different reasons. While humans develop thirst due to water loss and increasing sodium concentration in the blood, horses are more likely to seek water when fluid losses cause a decrease in blood pressure—a much slower process that might mean failure to drink sufficiently for hours and many miles into a ride.

14 Useful tricks developed by experienced competitors to encourage drinking during trailering include adding a cup or two of rice bran, or a favorite feed that breaks down quickly, into a bucket of water and offered at stops. Some horses do better if they remain in the trailer without significant distractions, while others drink better if they have the opportunity to unload, stretch their legs with a short, brisk walk, and a few minutes to slurp down "soup" or a sloppy mash before reloading.

15 Another good trick is to provide a very sloppy, watery mash inside the trailer to snack on while on the way to base camp. A large, wide tub can be secured at chest height, filled halfway with "soup," and the unavoidable splashing minimized by adding in a length of 2"x4" wood to act as a baffle. This often results in at least a gallon or so of liquid ingested to stave off fluid losses. Withholding a favorite feed for a day or so before trailering, and then making sure the mash is made of a highly-anticipated mix, helps ensure consumption along the way.

16 While on the trail, a horse that is reluctant to drink can ***not*** be encouraged to drink by rinsing his mouth with water, or dipping his mouth in water from a bucket. In fact, water in the mouth triggers a reflex that immediately shuts down thirst and drinking response. As such, if your horse needs to drink, then let his mouth go dry. Do not add water, thinking that might start the drinking process. It doesn't and actually delays him doing so.

17 Both at checks and at base camp, research has indicated that horses' water intake is increased by 10% if their eyes never go below the rim of the container. The same holds true for water containers without wide handles that horses might view as a head trap. Better to provide water at camp in large, wide tubs (the average muck bucket tub holds about 16 gallons of water when filled to the brim) rather than buckets.

Another good tip is to use a permanent marker to make a line marking off the gallons of water consumed overnight. If you are used to your horse drinking five gallons overnight, and suddenly his consumption is down to two gallons, look for the possible cause and keep an eye out for a impending problem.

18 Research into water temperature preferences conducted at the New Bolton Center at University of Pennsylvania indicate that, even in cold weather, horses seem to prefer drinking colder water, around 45°F. However, if they do not have access to cold water, and only have access to warmer water (around 65°F), they will drink more of that warm water than they do cold. The take-home information here for endurance riders is that at cold rides, horses will continue to drink cold water overnight, but water consumption is more likely to increase if their only choice is drinking warm water.

19 Before starting off on any endeavor where you know water consumption needs to be optimized (whether before loading up into the trailer or before the start of a ride), you can kick-start thirst responses by syringing an ounce of plain table salt mixed with equal volume of applesauce, kaolin-pectin, molasses or pancake syrup (kosher salt tends to dissolve in liquid the easiest), an hour or just before you set off.

Using a complete electrolyte mix isn't necessary, as the additional electrolytes of potassium, magnesium and calcium aren't in short supply right then, and only sodium will encourage a thirst response to kick in. If you do use a commercial mix, use one where sugar (or dextrose, maltodextrin, sucrose, etc.) is not the first ingredient. Those mixes are likely to be more palatable, but much less useful in stimulating water intake.