Water most overlooked nutrient for horses

By JOE D. PAGAN*

The most important nutrient for horses is one that is rarely added to feeds: water. Though it is often overlooked in discussions involving equine nutrition, water should be considered the first-limiting nutrient of all horses, as they cannot survive for as many days without water as they can without feed.

The amount of water required by the horse is determined by the magnitude of losses of water from its body. These losses occur through feces, urine, respiratory gases and sweat and, in the case of lactating mares, through milk. These losses are affected by the amount, type and quality of the feed consumed, environmental conditions and the health, physiological state and physical activity of the horse. Horses will generally consume more water than they need if given access to a palatable water source.

Horses at rest in a moderate climate will generally consume between three and seven liters of water per 100 kg of bodyweight. This translates to around 4-9 gal. for an 1,100 lb. (500 kg) horse.

Diet plays a major role in determining voluntary water intake and requirements. As a general rule, water intake is proportional to dry matter intake, but the composition and digestibility of the diet can alter this relationship substantially. Horses consuming all-hay diets drink more than horses fed a large amount of concentrate coupled with hay or a complete pelleted diet (Cymbaluk, 1989).

In another study, horses fed 5.8 kg of a hay-only diet drank 17.8 kg of water compared to 10.1 kg of water consumed by horses fed 1.8 kg of grain plus 1.3 kg of hay, which was partly because of lower dry matter intake, as well as a different dietary composition (Danielson et al., 1995).

Fiber intake affects water requirements for two reasons. First, when horses consume forage, water shifts from the interstitial space into the gut. This results in a decrease in plasma volume that triggers a thirst response. A meal of 2.27 kg of hay resulted in elevated total plasma protein (an indirect measure of decreased plasma volume) and greater water intake than when a similar-sized grain meal was fed (Pagan and Harris, 1999).

Second, plant fiber has a greater water-holding capacity and is less digestible than other components of the diet, resulting in greater fecal water losses. The physical form of forages also affects fecal water losses.

In a digestibility study, horses fed alfalfa hay in a long-stem form had significantly wetter feces (81.5% versus 75.2%) than when an identical amount of the same forage was fed in a pelleted form (Pagan and Jackson, 1991).

Diet can also affect urinary water loss. High salt intake increases urine output and stimulates thirst. Also, protein intake above the horse’s requirement increases water intake and urinary output as the horse voids excess nitrogen via urine.

Besides increasing water requirements, this creates an environmental hazard for stalled horses since the nitrogen in urine is broken down into ammonia in the horse’s bedding.

Body condition can affect water intake as well. Because fat is low in water content compared to lean body tissue, obese animals typically require less water than animals maintained at a more optimal body condition (Kohn and DiBartola, 1992).

Ambient temperature influences water intake. Horses typically drink less water in cold weather. Water consumption of weanlings exposed to cold temperatures — between -8°C and -17°C — was as much as 14% lower compared to that of weanlings housed in temperatures warmer than 8°C (Cymbaluk, 1990).

Heat and humidity increase water requirements, especially in exercising horses. In one trial (Geor et al., 1996), daily water intake increased 79% when horses transitioned from a thermoneutral environment (20°C and 45-50% relative humidity) to a hot, humid one (33-35°C and 80-85% relative humidity).

In addition to temperature and humidity, other factors affect water intake of equine athletes, primarily duration and

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intensity of work, as well as acclimation of the horse to the environment. Depending on the conditions in which a horse is exercised, total water intake by a 500 kg horse could reach more than 90 liters per day (National Research Council, 2007).

Aside from equine athletes, lactating mares drink more water than other horses. Increased intake is likely due to a combination of factors, principally the fluid losses associated with milk secretion and the increased consumption of feed to support milk production. Though other factors, such as diet composition and ambient temperature, will play a role in the volume of water consumed, 500 kg lactating mares may drink up to 75 liters per day (National Research Council, 2007).

Certain illnesses predispose a horse to increased water consumption. A horse with diarrhea but with a normal appetite and thirst might have incredible fecal water losses. The horse compensates for fluid losses by boosting water intake and decreasing urine output. Without a resolution of the diarrhea, however, dehydration is likely.

Polydipsia, or excessive drinking, especially when combined with other signs such as hirsutism, might be indicative of equine Cushing’s disease or renal insufficiency.

Horses should always have free access to good-quality, palatable water except after strenuous exercise, when the horse is still hot. These horses should be cooled down before being allowed as much water as they want to avoid colic or laminitis. However, before and during prolonged physical activity, the horse should be allowed to drink as often as practical and as much as it wants.

References