

# Equine Welfare Series

## Water: The Most Essential Nutrient

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Water is the most essential nutrient for a horse's health. A clean, fresh source of water is needed to maintain overall body function including digestion, body fluid balance and hydration. Dehydration can quickly pose serious health problems to the horse and in extreme cases can result in death. The amount of water a horse will drink per day can vary greatly depending on workload, body weight, maturity, environmental factors, season, diet and individual horse variation. Proper management and attention to water sources are easy ways to ensure proper horse hydration all year long.

### Water Intake Requirements

Water intake occurs primarily from drinking liquid water, with a smaller but important amount of intake supplied by moisture in the horse's forage and concentrate feedstuffs. Ideally, horses should always have unrestricted access to clean, fresh water sources. However, if accustomed, horses can drink their daily water requirements in a minimum of two watering sessions per day.

Body weight is the major determining factor of the total amount of water to be consumed by the horse daily. Maintenance water requirements are mainly based on the horse's body weight and are needed to sustain life (digestion, respiration, walking/seeking food and water, urination, etc). A 1,000-pound horse at maintenance will typically consume 6-10 gallons of water per day or 5 liters of

water per 100 kilograms of body weight. Water requirements for horses at maintenance, in work, or during pregnancy and lactation can vary greatly (table 1).

Horses grazing on pasture gain a large amount of water intake from grasses; however, equines maintained on a hay-grain based diet will not gain as much water from eating drier feedstuffs. Additionally, as the horse breaks down dietary nutrients small amounts of water are made during breakdown of proteins, carbohydrates and fats. Composition of the diet can also influence water intake. High amounts of fiber, protein and some minerals, including sodium and potassium, increase urine

*Table 1: Water intake ranges for a 1,000-pound horse in varying class and temperatures.*

| Class             | Outside Temperature (degrees F) | Range of Water Intake (gallons/day) |
|-------------------|---------------------------------|-------------------------------------|
| Maintenance       | 68                              | 6 to 8                              |
|                   | 86                              | 11 to 14                            |
|                   | Less than 0                     | 10 to 13                            |
| Pregnancy         | 68                              | 7 to 9                              |
| Lactation         | 68                              | 14 to 21                            |
| Moderate Exercise | 68                              | 10 to 12                            |
|                   | 95                              | 19 to 24                            |

*Individual water intake can vary greatly dependent on diet, stage of growth, pregnancy or lactation, and workload, along with seasonal and environmental factors. It is best to offer horses free choice access to clean, fresh water daily to prevent dehydration. Adapted from NRC, 2007.*

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Temperature and exercise can greatly influence a horse's requirement for water. Cold weather reduces typically reduces water intake, yet a horse's water requirement will often increase in cold temperatures. Make sure the horse does not become dehydrated in this situation. Hotter temperatures will increase intake based on relative humidity and ambient temperature combined, also known as the heat index. In hot, humid conditions a 1,000-pound horse can release nearly 2 gallons of sweat per hour. Water needs of working or competitive horses relate directly to duration and intensity of exercise, fitness of the horse, and environmental conditions. Water intake can increase anywhere from 20-300 percent of maintenance levels based on these exercise factors.

Although it is commonly thought that hot horses should not consume large quantities of water or have unrestricted water access until body temperature has returned to normal, there is no scientific basis to support the claim. Horses should be offered free access to water whenever possible. Additionally, while traveling or in a new environment, horses may display a reluctance to drink. Water additives are available to alter the flavor or electrolyte content (if needed) to water and should be provided to the horse at home in order to allow

time for familiarization with the products prior to travel. The time needed for each horse to adjust to flavored water can vary. Water can also be brought from home while traveling to encourage water intake.

## Water Losses

Horses lose water in a variety of ways. Losses in the urine, fecal matter and sweat production are the most visible; however, the horse also loses water during respiration. Additionally, lactating mares will also lose water to milk production and in response to an increased feed intake to meet nutrient demands.

The intestinal tract is the largest water storage reservoir in the horse and, therefore, can contribute the most to overall water losses. For example, a 1,100-pound horse at maintenance can lose approximately 5 gallons (19 liters) of water per day in the manure. Horses eating a diet consisting mainly of hay will have wetter manure (72-85 percent moisture) compared to those consuming a highly digestible, grain-based diet (66 percent moisture content, NRC, 2007). Diarrhea can increase water losses tremendously, as fecal moisture content can exceed 90 percent. Due to increased passage rate through the large intestine, diarrhea can also cause a reduced amount of water absorption from the gastrointestinal tract.

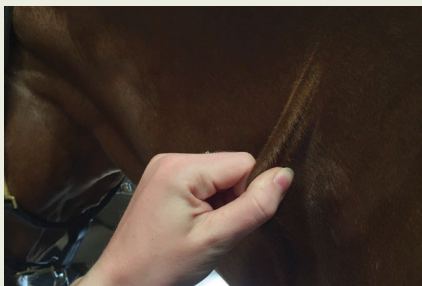
The kidney regulates body fluid balance and thus has the ability to alter urine concentration to maintain proper hydration. When water intake exceeds the horse's needs, high volumes of diluted urine are produced. In contrast, small volumes of concentrated urine are made in order to conserve water during times when daily intake is below the horse's needs. Even during times of total water deprivation, the kidney will still produce urine. At a minimum a 1,000-pound horse will make 2.2 liters (0.6 gallons) of urine daily, which will further contribute to dehydration.

## Dehydration

Hydration is a reflection of total body water balance within the horse and can be achieved when water losses are equal to water intake. When water loss is greater than water consumption, dehydration can occur. Horses consuming inadequate water will become dehydrated. Health complications from dehydration can be widespread and include loss of appetite, lethargy and colic. Horses should be monitored for these signs regularly. Additionally, horses may experience weight loss and can develop kidney disease along with other health complications. A total lack of water is more rapidly fatal than a lack of feed, and caution should be used to ensure horses are never without water for extended periods of time. Because of its vital nature to the horse, water is considered to be the most essential nutrient.

A skin tent test can be used to quickly assess a horse's hydration level. In order to perform a skin tent test, pull the skin away from the body below the point of the shoulder as shown in Figure 1 and then release. In hydrated

*Figure 1: Skin tent test.*



*Pinch skin on the neck or just below point of the shoulder to form a "tent." Release and note time until skin returns to normal. If under 2 seconds to return to normal horse is considered hydrated, if over 2 seconds horse is dehydrated.*

horses the skin will return to a normal position within 2 seconds or less. A dehydrated horse's skin does not have as much elasticity and will return to normal more slowly. If you believe your horse is dehydrated, contact a veterinarian to perform an exam and develop a treatment plan. A veterinarian can determine level of hydration by examining a blood sample for packed cell volume or hematocrit if a more specific evaluation method is needed.

## Tips for keeping horses hydrated

- Horses should have access to clean, fresh water sources and should be allowed to drink their fill at least twice a day.
- Daily water requirements will vary based on a number of factors.
- Horses with excessive diarrhea will require more water and electrolytes per day than normal.
- Consideration should be given to ambient temperature, humidity and wind. All of these factors can impact a horse's daily water needs.
- Lactating mares require 50-80 percent more water per day for milk production compared to maintenance intake levels.
- Hay, grains and some concentrates are very low in moisture and will cause horses to increase water consumption.
- Fresh pasture contains between 60 and 80 percent moisture and can provide a large amount of the daily water requirements for horses when grazing. Horses grazing fresh pasture should still have free access to clean, fresh water daily.

## Resources

NRC. 2007. Nutrient Requirements of Horses. Washington, DC, National Academy Press.



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