

Basic Nutritional Guidelines for Equine Management¹

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Providing proper and adequate nutrition for horses is a challenge all owners must face. Understanding the horse's nutritional needs is important not only to optimize performance, but also to ensure the horse's safety. The following guidelines emphasize key points to keep in mind when determining how to meet your horse's nutritional requirements.

1. Provide clean water daily. A normal, healthy horse will consume approximately 5-15 gallons of water per day depending on temperature, humidity and activity. If water isn't available free choice, then water a horse at least twice per day for several minutes until satisfied.
2. It is a common practice to limit the amount of water consumed when cooling out a hot horse to prevent digestive and metabolic disturbances such as colic and laminitis. Limit their intake to frequent sips rather than long gulps until temperature, pulse and respiration begin to approach normal (normal resting values are: temperature 99.5° to 101.5°, pulse 32-36 beats per minute, respiration 8-12 breaths per minute). Recent research, however, has indicated that horses may actually suffer no detrimental effects from rehydrating quickly. However, this study also found that restricting water intake

immediately following intense exercise did not cause horses to have lower total water intakes within 60 minutes post exercise as compared to those allowed free choice water intake ("Effect of varying initial drink volume on rehydration of horses", Butudom et al., *Physiology and Behavior*, Volume 79 Issue 2, July 2003, pp.135-142). Since opinions are still mixed on this subject it is up to the owner to determine how cautiously to proceed.

3. During cold weather, horses may not be inclined to drink enough, particularly if the water provided is icy. This makes the horse more susceptible to impactions and other forms of colic. Some of this can be prevented by top dressing the horse's feed with a small amount (e.g. 1-2 oz) of salt on extremely cold days to encourage the horse to drink enough water. Another option is to provide water warmed to ambient temperature at least twice daily.
4. Feed horses individually and observe their eating habits. Each horse has its own eating habits; knowing these will help determine when a horse goes off feed or may be having dental problems.

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5. The horse has a relatively small stomach and naturally eats often. For horses that are confined or partially confined, feeding at least twice a day improves disposition, appearance and efficiency of feed utilization. Increased numbers of feedings help prevent stall vices such as cribbing and weaving. When adding feedings, the same total amount of feed should be fed; feed should just be split into smaller portions. Limit meals of grain feeds to less than 0.5% of body weight each feeding. For example, if you have a 1000 pound horse that requires 10 pounds of grain, each feeding of grain should be no more than 5 pounds. Therefore, horses that require large amounts of grain should be fed more frequent meals in smaller amounts.
6. Horses are adapted to eating forages (grasses and hays) due to a microbe containing hind gut adaptation called the cecum. A horse should be fed at least 1%, preferably 1.5-2%, of its body weight in roughage (on a dry matter basis). Feeding too little roughage can lead to severe health conditions such as colic and ulcers. Grain can be supplemented to the horse's forage diet if their needs are not being met with forage alone. Some horses will require no additional grain while some may require 1.5% or more of their body weight in grain, in addition to forage, to maintain their weight depending on metabolism, age, and activity level. If forage alone is not meeting a horse's requirements, options include feeding a higher quality forage, adding grain to the forage diet, or replacing part of the horse's forage with grain. No matter what option is taken, the horse should always be fed a minimum of 1% of its body weight in forage.
7. Feed quality forage, concentrate grains and supplements. Respiratory, digestive and nervous problems may result when dusty, moldy or spoiled feeds are fed. If severe enough, consumption of contaminated feeds can result in death. Be sure to store feeds in a dry environment; avoid rain and humidity as much as possible. Also, feeds tend to spoil faster in hot and humid summer months so be sure to watch feeds closely during this time.
8. Feed based on weight of feed, not volume of feed. For example, pellets tend to be denser and therefore have a greater weight per volume of feed as compared to sweet feed. Flakes of hay also differ in weight, and therefore two flakes of hay can vary widely in amount. Knowing how much your scoop of grain or an average flake of your hay weighs can help you make appropriate adjustments in quantity when increasing the amount fed as well as when switching to a new product. Also, nutrient requirements for horses are typically given based on weight (see bullet #25) so knowing how much your horse eats will be helpful for any calculations you may want to perform.
9. Feedstuffs should be selected based upon energy content, protein, fat, and fiber. Diets should be formulated based upon the horse's requirements for these nutrients, as well as their requirements for essential vitamins and minerals (reference bullet #25 for further information on specific requirements).
10. Feed a high quality ration. The level of feed required will vary with individual animal difference, the condition desired, the level of activity, and the age of the animal. Poorer quality hays and grains are less digestible to the horse and therefore must be fed in higher amounts to achieve the same condition. Sometimes feeding cheaper feeds that are made from less digestible ingredients may actually cost more to maintain the horse versus feeding a more expensive, higher quality product.
11. Make changes gradually when altering a horse's feeding program. For example, when changing types of feed, begin by replacing a small amount of the previous feed with the new feed. Over the course of several days to two weeks, gradually replace more of the old feed with new feed until the horse is completely switched to the new feed. Horses have microbes in part of their GI tract that help digest certain feeds. Microbes must be given a chance to adapt to changes in feeding programs. This will help prevent digestive disturbances such as colic.

12. Feed at approximately the same time each day. This is especially important if you are your horse's only source of grain and forage (e.g. stabled horses). Many horses will become agitated if they are not fed when they think they should be fed. This often results in digestive disturbances.
13. Provide free-choice loose salt-vitamin-mineral mix. Horses are not efficient lickers, therefore, salt blocks do not work as well for horses as a loose mixture. Mineral blocks are generally less than 5% mineral and over 95% salt so they do little to provide for the vitamin/mineral requirements of the horse. Horses will consume 1 1/2 to 3 oz. per day of a loose mix.
14. Horses that have been worked should be adequately cooled out prior to feeding. For best performance and to reduce potential metabolic problems, it is best not to work horses until at least one half hour after feeding a concentrate.
15. Note the feces for changes in color, odor and consistency, as well as for the presence of worms or excessive amounts of undigested grains. These observations can give an indication of many problems including metabolic, digestive, dental, and dehydration issues.
16. Adequate exercise is essential for the overall well-being and health of the horse, both mental and physical. If the horse is not in a riding/training program, be sure to provide several hours a day of pasture turnout for the horse.
17. Following intensive training, a horse's exercise regime and feeding program should be gradually reduced rather than abruptly ending. Make exercise and feeding changes gradually over a period of two weeks to a month depending on previous activity level.
18. Rapid consumption (bolting) of feed should be discouraged. To help prevent choke and metabolic disorders, spread the feed out over a large area, or place large, smooth rocks in the feed tub (i.e. baseball sized rocks so that the horse cannot inadvertently eat the rocks).
19. Make certain that the feed and water troughs (buckets, etc.) are cleaned as needed and no standing water is left in feed buckets. Feed accumulating in wet buckets can decay and mold, potentially causing health hazards in horses that may eat out of them.
20. Improper amounts, both excesses and deficiencies, of vitamins and minerals should be avoided. These conditions most commonly occur when feeding single grains, cutting formulated feeds with a grain, or because too many or improper supplements are fed. Be able to read a feed tag and understand if the feed meets your horse's requirements. See bullet #25 for more specific information on vitamin and mineral requirements.
21. Coarse grinding, cracking, rolling or crushing increases palatability and feeding value 5-10% with most grains. These processes break down the seed coat, and make the grain more digestible. However, finely ground grains should not be fed to horses. Dust from feeding finely ground feeds can cause respiratory problems.
22. Withhold one half of the grain ration and increase hay on days when working horses are idle. Some horses are prone to metabolic disorders which cause their muscles to "tie up". These problems can often be controlled by limiting grain intake on days when working horses are confined to stalls with no exercise.
23. Feeding a very tired horse a full feed of grain is risky. An extremely hot horse should not be fed any grain until cooled to resting heart rate and temperature. Even after cooled, if the horse has been previously worked to exhaustion, the grain could be cut into two feedings. To help prevent digestive disturbances and metabolic disorders, feed only half the grain, then feed the remainder one hour later.
24. The National Research Council (NRC) lists approximate nutrient requirements for horses based on age, weight, workload, and status. This is a useful resource in determining if a particular diet meets your horse's needs. A helpful website by which to access this information is: <http://nrc88.nas.edu/nrh/>. This website allows

you to select the age, weight, status, and workload of a particular horse (under “Animal Specifications”) and determine its specific nutritional needs for macronutrients (given in the table at bottom of webpage) as well as vitamin and mineral needs (under “Other Nutrients”). This program also allows you to select certain forages and other feedstuffs (under “Dietary Supply”—click on “New” to change feedstuff) to determine how much of your horse’s requirements are being met by that particular feed or combination of feeds (you must input the weight of each feedstuff being consumed).

25. Most feed companies have nutritional representatives and consultants. These people are available to answer any questions or concerns you might have regarding your horse’s feeding program. Additionally, for more information you can contact your local county extension agent.