

## Nutritional Supplementation for Horses on Pasture in Virginia

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Horse owners are becoming more educated about pasture management and forage selection. As a result, they are improving the quality of the forages their horses are grazing. Yet, even when a pasture is well managed, horses may require nutritional supplementation to meet their needs. When might your horse need access to more than just forage? Consider the following:

- **Quality of forage:** Refers to many things, but includes the nutrient balance (energy, sugar, protein, fiber, etc.) and the availability of those nutrients (often related to plant maturity) when the forage is grazed.
- **Quantity of forage:** Refers to the horse having access to enough forage to meet its requirements.
- **Forage species:** Refers to forage being a grass, a legume, or mixed. Energy and nutrients vary between species.
- **Pasture management:** Refers to such practices as stocking rate, grazing management, fertilization and soil pH and mowing and dragging, etc.
- **Season:** Refers to effects on forage growth, i.e. spring or fall growth versus effects of summer drought or winter cold.
- **Production or activity:** Refers to the physiologic demands on the horse, including maintenance, gestation, lactation, growth, or exercise.
- **Body Condition:** Refers to the horse being over- or underweight.

### Water

Water is possibly the most important nutrient for the horse, and not drinking enough will result in dehydration. Whereas a horse can lose nearly all its body fat and half its body proteins before significant health issues arise, a loss of only 10 percent to 15 percent body water can result in the death of the animal. Fresh, clean water should always be made available to the horse; it will adjust its intake based on need.

When pasture forages are growing rapidly, they can be as high as 80 percent moisture. This does not mean the horse does not need fresh water available. As forages mature, or as the environmental temperature rises, horses will need increasing amounts of water to meet their needs. Moderate- (jumping, gaming, cutting, etc.) and hard-working (racing, polo, three-day-eventing, etc.) horses and lactating mares in particular have an increased need for water. During the winter, water intake may decrease as a result of lower water temperatures, potentially increasing the risk of impaction colic. Warming the water up to 40°F will often encourage the horse to drink adequately.

### Energy

Energy, in the form of calories, is required for normal metabolism. Too little energy will result in the horse losing weight while excess calories will result in a horse gaining weight. In a temperate climate like Virginia, there are two times a year when energy supplementation may be needed for horses on pasture: the middle of summer and during the winter. Environmental condi-

tions are such that certain grasses aren't growing during these times and the overall nutrition in the plant is lower. During winter, the horse's energy requirements will increase in order to stay warm.

Most pasture forages will provide enough energy for the maintenance or light-working horse, particularly when the pasture grasses are young and rapidly growing (spring and fall). It is relatively simple for a maintenance or light-working horse to over-consume rapidly growing forage, especially on a well-managed field. This can result in excessive weight gain or growth problems in young horses. During these times, you may have to restrict the horse's access to pasture or increase its activity level, whichever is more appropriate. Moderate- and hard-working horses will usually require supplemental energy in order to maintain their body weight and level of performance. Gestating broodmares will have increasing energy needs as gestation progresses, and the lactating mare's requirement will be higher still. The highest energy demand on a body weight basis is in the growing foal. Sometimes broodmares and foals cannot consume enough forage to meet their energy needs and a supplemental energy source, such as grain, is needed.

Forage species will affect energy concentrations in a pasture. The more legumes planted in the pasture, the higher the energy level. Over the past 40 years, forages have been selected for higher and higher quality in order to help put weight on production livestock. These same forages are being used in many horse pastures. Combine better management with higher quality forages and you may end up with an obese horse whose only feed has been pasture. In this situation, you may need to remove the horse from pasture after a few hours, confine it to a dry lot, and offer a lower energy, more mature hay. If this is not an option, then use a muzzle. A muzzle limits the amount of grass the horse can consume and may help control obesity. Increasing the horse's exercise will also help control its weight.

Mature forages have lower digestible energy concentrations since energy and other nutrients are diverted into building the support structure for the plant and for seed production. This decreased digestible energy may not meet the needs of exercising horses, gestating and lactating broodmares, and growing foals. More mature forages can be of benefit to the maintenance or overweight horse, giving it something to chew on without adding excess energy. Take care to ensure that the horse's nutri-

tional needs are met with the remainder of its diet, and remember that the higher fiber of mature forages can be a risk factor for impaction colic.

Whatever the situation, an energy supplement is needed if a horse is not maintaining an appropriate body condition on pasture forages alone. During the winter or when forages are not growing, giving the horse access to high-quality hay may be all the supplementation that is needed. Other times, additional nutritional energy supplements will be beneficial. There are high-fat feeds (liquid or dry) that are designed to add energy to the diet. If your pasture is otherwise nutritionally sound, this may be sufficient. Ideally, a nutrient analysis of the pasture forages would allow you to best match a supplement or grain to that forage. Buying a high-fat (6 percent or higher) concentrate from a reputable feed company will most likely meet your needs.

## Protein

Protein is made up of amino acids, which are the building blocks for the body's metabolic machinery and structure. Most pasture forages meet the protein requirements for most production levels and may exceed maintenance and working requirements. Hard-working horses, broodmares in early lactation, and growing foals may need supplemental protein, particularly if the pasture contains only grasses. You can supplement protein by adding legumes to the horse's diet, either as pasture or hay; as mentioned before, broodmares in late gestation and early lactation and growing foals may not be able to consume enough hay to meet their needs. If adding legumes either is not an option or still does not provide enough supplemental protein, you can feed a commercial ration balancer or grain mix.

## Vitamins

Vitamins are necessary for many metabolic processes in the body. Deficiencies generally result in poor growth and performance and an unthrifty appearance, though there can be specific symptoms associated with certain vitamin deficiencies. Between a well-managed pasture and a healthy microbial population in the horse's intestines, most vitamin requirements are easily met. Vitamins A and E are not produced by the horse or the gastrointestinal microbes and must be provided in the feed. During the growing season, there is usually enough vitamin A and E in pasture forages to meet requirements.

While horses will usually have their vitamin needs met by pasture forage alone, there are situations where vitamin supplementation will be beneficial or needed. Hard-working horses, including those under constant stress such as traveling or showing frequently (weekly), or those that are excessively nervous or hyperactive may benefit from supplementation. Research has shown that stores of vitamin A may be depleted by mid-winter in horses on pasture alone. Nursing foals may lack a fully developed hindgut microbial population and may need additional vitamins added to their diet to help support the immune system if they are under stress. Finally, horses that have been ill, particularly with intestinal ailments, or those undergoing extended use of antimicrobials which harm the microbial population in the gut, will benefit from supplemental vitamins as well.

In general, legumes and grasses have equivalent amounts of vitamins. When needed, supplementation of vitamins can be accomplished by adding commercial vitamin supplements or by using a fortified ration balancer or grain mix.

## Minerals

Minerals are used in a variety of ways in the body, and fall into two categories: macro-minerals, which include calcium, phosphorus, sodium, chloride, potassium, magnesium, and sulfur; and micro-minerals (trace minerals), which include iodine, copper, zinc, selenium, manganese, iron, and cobalt. Macro-minerals are needed for body structure, acid-base (or pH) and fluid balance, nerve conduction, and muscle contraction. Trace minerals tend to be involved in the formation of enzymes and in controlling various physiological processes. Depending on soil properties and fertilization practices, legumes and grasses tend to be equivalent in mineral content with the exception that legumes are higher in calcium.

Calcium and phosphorus, most well known for their function in bone formation, are usually considered together as their ratio is important. The rule of thumb is a 2:1 ratio of calcium to phosphorus in the overall diet, with 1:1 being the minimum. Dietary phosphorus should never be higher than calcium. Grasses tend to have a better ratio of calcium to phosphorus, but they can become deficient in both if they're too mature. Legumes often contain much more calcium than is required by the horse and the ratio can be as high as 6:1. This amount of calcium can lead to developmental orthopedic issues in growing horses. Calcium and

phosphorus supplementation is beneficial for horses grazing mature grasses, but including legumes in the pasture will offset this. Winter pastures in central and north-central Virginia have been shown to be deficient in phosphorus, so supplementation with a ration balancer or concentrate may be appropriate.

Sodium, chloride, and potassium, also called electrolytes, are involved in pH and fluid balance in body tissues. Sodium and chloride are considered together since they are usually provided by white salt (NaCl). Sodium levels tend to be low in forages, so horses on pasture should have free choice access to at least white salt. If the horse is sweating excessively, which may happen in hot, humid weather or during intense exercise, a horse will usually increase its salt intake enough to meet its needs so long as salt is available. Potassium typically is present in most forage in enough quantities to meet any horse's needs. As with salt, if the horse is sweating excessively, it may need supplemental potassium. A mixture of white salt and light salt (KCl) may suffice.

Copper, zinc, and selenium are the only trace minerals of real concern in Virginia, as copper and zinc are marginal or low and selenium is almost always deficient in its soils and forages. Well-managed forages may have enough copper and zinc for the mature and exercising horse, but can easily be deficient for a gestating broodmare or a growing foal. As such, mares and foals should have access to a dietary supplement containing additional copper and zinc. With regard to selenium, the maintenance horse may receive enough in forages to meet its requirements, but exercising horses, gestating broodmares, and growing foals should have some supplemental selenium in their diets. Typically, the horse's requirements for these trace minerals can be met by either providing a trace mineralized salt with added selenium, or by adding a ration balancer or a commercial feed.

## Summary

A well-managed pasture will meet the nutritional needs of maintenance and light-working horses with little or no supplementation. However, you must consider the season, type of forage, and the production level of the horse. Moderate- and hard-working horses, along with gestating and lactating mares and young, growing horses often need more energy, protein, vitamins and/or minerals than pasture forages provide and may benefit from a ration balancer, vitamin/mineral supplement, or a standard commercial feed. A mixture of legumes

and grasses provides the best balance of nutrition in a pasture. Keep in mind that young, actively growing forages have higher levels of nutrition than mature, seed-producing forage, and different supplementation may be needed at various times of the year to make up for deficiencies.

Several other Virginia Cooperative Extension publications that address forage species, pasture establishment, pasture renovation, and grazing are available online. Visit [www.ext.vt.edu](http://www.ext.vt.edu) or talk to your local Extension agent for more information.

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