Equine Nutrition

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The Basics

Nutrition is one of the most debated topics a horse owner encounters. Every owner, trainer, veterinarian and nutritionist is likely to have a different approach to feeding, resulting in confusion for the horse owner. Important criteria to be aware of: available feed sources, circumstances for particular feed sources, and nutritional demands of each horse. Implementation of sound feeding practices helps prevent dietary-related problems such as colic, diarrhea, weight loss, vitamin and mineral imbalances, and poor performance.

The digestive tract is designed for constant intake of high fiber feeds (grass, hay). At pasture, horses spend 16 hours a day grazing; stall confinement and intermittent feeding present a dramatic change in the natural routine. The horse's stomach is small (suited for frequent grazing) in relation to the rest of the gut, so food exits the stomach rapidly. Gastric ulceration is a common problem leading to chronic colic and a poor appetite. High grain diets and a stressful lifestyle can promote stomach ulcers, a condition rarely observed in pasture-kept horses. The small intestine is apx. 70' long and is the major site for absorption of protein, carbohydrate, vitamins, minerals and some fat. Concentrate feeds are mostly digested in the small intestine. Forage digestion occurs in the large intestine. Digestion of carbohydrate (concentrate feeds) must be minimal in the large intestine to avoid excessive fermentation leading to residual problems (i.e. impaction colic from poor quality hay, gas colic from sudden dietary changes, sand colic from sandy ground, and grain overload from ingesting more grain than accustomed to).

Nutritional demands of each horse differ significantly depending on physiologic requirements and ambient temperature. Requirements automatically increase with growth, breeding, gestation, lactation, exercise, disease and cold weather. Dietary adjustment can be an important adjunct to the treatment of particular diseases, such as cartilage and tendon diseases in young horses, respiratory disease (heaves) and exertional rhabdomyolysis ("tying up").

Forages and concentrate feeds are the two main equine feed sources, but fat is rapidly becoming a popular high energy feed supplement.

Forages: An essential part of the diet and should constitute apx. two thirds of the ration once a horse reaches 1 year. Grasses (timothy, orchard) tend to be lower in energy and protein, and less palatable if cut in late maturity. Legumes (alfalfa, clover) are more palatable, and contain more energy, vitamins, and minerals than grasses. Legumes can contain twice the protein of grasses which is often more than required. Young hay is more digestible than older hay and can be fed with less concentrate. Good quality forage is generally adequate to sustain a sedentary horse with no extra physiologic demands.

Concentrates: This term encompasses everything in the grain mix, including vitamin and mineral supplements. Concentrate feeds are necessary in horses with energy and protein requirements exceeding those supplied by good quality forage. They are usually divided into cereal grains (oats, barley, wheat, corn, rice) and protein grains (soybean, cottonseed, linseed, canola). Cereals have a lower protein and mineral content than protein grains. The more digestible the grain, the safer it is to consume. Poorly digestible grains have a greater chance of passing through the small intestine undigested, reaching the large intestine where they will ferment, resulting in bacterial overgrowth and production of toxins and acids that are absorbed by the blood. If a large amount of grain is consumed when not accustomed to it, severe grain overload can result leading to diarrhea, founder, and occasionally shock and death. Oats are very safe and can be fed in higher quantities; they are easily digested. Rice, barley, wheat and corn are progressively less digestible. Processing of grains, such as cracking, heating and rolling will increase digestibility. This may be recommended for older horses that can no longer chew well and have less ability to absorb nutrients.

Fat: Fat is a very energy dense feed source, providing at least twice the amount of energy as a carbohydrate based feed (grain). Feeding fat can increase energy intake considerably without increasing actual feed intake, and can reduce the amount of concentrate required. It is very useful for older horses and those having trouble maintaining weight. Corn oil appears to be the best accepted but must be added gradually to avoid rejection (start with a tablespoon/day). Fat can be gradually added up to 10% of the concentrate part of the ration. Other benefits are improved hair coat, reduced dustiness, improved vitamin absorption, and decreased internal heat production beneficial for horses exercising in a warm climate. Recent UM College of Vet. Med. research confirmed that feeding a high fat diet can be beneficial in reducing the signs of 'tying up' in horses prone to the syndrome.

Electrolytes: Electrolyte supplementation is necessary in horses that sweat significantly. Light to moderate exercise in cool conditions causes a loss of 5-7 liters of sweat/hour, which can easily double in hot conditions. Sodium and chloride are usually lost in the greatest amount. A salt block is usually adequate to replace losses in lightly exercised horses. However, voluntary consumption of salt varies, so when the temperature or exercise demands increase, it is advisable to mix 2 ounces of table salt, or a combination of table salt (sodium chloride) and lite salt (potassium chloride) into the ration. It is crucial when feeding salt that fresh water is continuously available.

Feeding practices: Sound management practices help prevent dietary related problems.

- Provide adequate quality forage (apx. 2/3 of the ration) to ensure normal large colon function
- Feed small amounts frequently to mimic normal feeding patterns
- Keep a regular feeding schedule - sudden alterations in feeding times can lead to severe anxiety and even colic.
- Store feed safely in a dry enclosure to avoid contamination by birds and rodents (Salmonella and Botulism). Ensure it is good quality to avoid problems such as feed toxins (moldy corn disease).
- Minimize overfeeding. A horse at rest with no physiological demands does not require any concentrate feed if good quality hay or pasture is available.
- Always introduce grain slowly to avoid colic and founder, and do not exceed more than 5-7 pounds of grain per feeding.

Feeding for Purpose

Feeding for purpose is an important component for proper equine nutrition. The appropriate amount and type of feed will optimize the outcome you are hoping for, but be careful not to over cater.

Pleasure Horses: Pleasure riding will not increase protein, vitamin or mineral requirements. Overfeeding protein is a common and expensive practice. Pleasure horses require only 8% protein in their ration. A 10% increase in energy intake for a horse ridden 30 minutes 3 times a week is usually adequate, and can be supplied by the addition of 2 pounds of alfalfa or 1 pound of oats. The amount of feed increase required varies with age, dental condition, and feed quality, so monitor exercising horses to ensure they maintain weight.

Aged Horses: Weight loss is a common problem in horses 16+ years. As a horse ages, ability to absorb nutrients from their diet decreases and protein requirements increase to 12-14%. Older horses should be fed top quality hay (preferably grass/alfalfa mix) and an easily digestible concentrate. Commercial pelleted 'senior' diets are available that are excellent for aging horses. Adding vegetable oil to the ration will also help to maintain weight and condition.

Mares: Overfeeding during pregnancy is common. During the first 8 months mares can be maintained on good quality forage at 1.5% –1.75% of bodyweight. Thin mares require additional concentrate or fat supplementation. During the last 3 months of gestation and during lactation, they have increased demand for energy, protein, calcium, phosphorus and vitamin A. If good quality forage is available (at least part legume) they can be maintained on 0.75-1.25% of their bodyweight in concentrate feed per day (heavy milking mares may require 1.75%). A vitamin and mineral supplement is advisable.

Foals: Excessively feeding foals is a common and potentially harmful practice, contributing to limb deformity and cartilage disease, providing no height or muscle mass benefit. Milk is sufficient during the first 2 months, and supplies all mineral requirements for the first 4 months. Foals usually display interest in solid feed within a few days of birth. Creep feeding can begin at 1-2 months to prepare for concentrates at weaning. Introduce foals to 0.5-1 pound of concentrate per day, gradually increasing to 4-5 pounds. Forage should also be available. It is important to ensure the foal doesn't sneak concentrate from the mare! Protein requirements for weanlings and yearlings are 11-13%, and their ration should ideally contain twice as much calcium as phosphorus.

Endurance/Event Horses: Heavy performance horses require up to twice the energy intake of resting horses. A good quality soluble carbohydrate (oats, barley, corn) is essential, and should be split into several feedings per day. Feeding a soluble fiber such as beet pulp (2-3 pounds/day) can create a reservoir of water and electrolytes in the colon to be drawn on during performance. Fat is an excellent way to increase calorie intake. Electrolyte supplementation is crucial and must be forced (mixed in feed or water, given as a paste, or by tube) due to heavy sweat losses encountered in performance.

Feeding in Winter: Malnutrition is a common winter problem due to increased energy requirements for heat production. A 30% increase in calorie intake is often necessary. Increasing forage intake is important, as hay produces more heat than concentrates when metabolized. Having horses in good fall condition helps maintain weight. Reduced water intake is a common winter problem leading to colic. Offer a warmed water source (be sure outside troughs do not freeze); mix 1-2 ounces of salt into the ration to encourage drinking.

Thus, there is no set recipe for feeding horses. Following reliable guidelines and good management practices usually results in a well-fed horse. Obtaining a basic equine nutrition text can provide a good reference when questions arise.