

# **Advances in Equine Nutrition**

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# TRENDS IN FEEDING THE AMERICAN ENDURANCE HORSE

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Endurance riding is one of the fastest growing equestrian sports in the United States. Its popularity stems from the incredible bond that develops between a horse and rider after taking care of each other for so many hours on the trail. Because of this bond, endurance riders tend to be particular about wanting everything to be just right for their horses. Endurance riders, in general, are the most educated and open-minded about nutrition of their horses. Nutrition plays such an important role in the success of an endurance horse that endurance riders have to make proper nutrition a priority in their management.

Why does nutrition make or break an endurance horse? The type of work that is asked of the endurance horse, low-intensity and long-duration exercise, is dependent upon body stores of fuel in the form of glycogen and fat. Composition of the diet influences the type of fuels horses store. Manipulating the amounts of fiber, fat, and starch in the diet can influence which of the fuels is then utilized for energy. A balanced diet with adequate fiber, fat, and starch, as well as proper fortification of vitamins and minerals, will go a long way in determining whether an endurance horse can finish a race.

The United States Equestrian Team (USET) has a program for training endurance riders that have aspirations of competing internationally. The USET offers yearly clinics in which lessons are given on all aspects of the sport, such as riding, training, farriery, saddle fit, sport psychology, health issues, rider fitness, and horse nutrition. KER has provided a nutritionist to counsel each rider on his or her horse's nutritional program during these clinics over the past two years. The following is a summary of the data acquired from 37 riders participating in clinics in the East Coast, Central, and West Coast regions of the United States in 2001. Although the numbers may be small, the data appear to be closely representative of endurance horses in general.

## The Horses

While any horse may have the ability to do endurance-type work, it appears that horses of Arabian descent excel in speed and endurance. Of the horses participating in the nutritional evaluation, 89% were of Arabian breeding, with 65% being

purebred and 24% being crossbred. Arabians are generally not large horses, and the average weight of this group was 460 kg. The average age of the horses was 9.4 years, with a range of 4 to 21 years. Endurance horses are not permitted to enter any race of 50 miles or more until they are at least 5 years of age. With proper management, horses with good conformation and strong bone can compete into their late teens and early twenties.

## **Forage**

There are many reasons why endurance horses do well in the United States. Most of these endurance horses have the advantage of being allowed to stay out on pasture as much as 24 hours per day. In this group of horses, at least 80% have 24-hour turnout. Not only is 24-hour turnout closer to the natural way in which horses evolved, but it also keeps bones stronger, muscles toned, and joints lubricated. Endurance horses that are kept in stalls are more likely to have muscle disorders and joint problems. Many regions of the country have quality pasture grasses so that the majority of the nutrition is coming from quality forage. Because Arabians are easy keepers by nature, quality pasture allows horses to maintain weight on little more than grass until they begin heavy work.

Regardless of pasture quality, horses will have to be supplemented with dry forage such as hay during some parts of the year. Over the years endurance riders have been advised to avoid pure alfalfa if at all possible because of the high protein and calcium content. In most regions of the country, grass hay is available and is the preferred forage for the endurance horse. Grass hay was being fed to 87% of the horses in the study. Only 22% received some alfalfa on a regular basis alone or in addition to grass hay. Alternative fiber sources like beet pulp are popular among endurance riders, and 60% of these riders fed beet pulp daily. This is in addition to the horses that were also getting beet pulp in their commercial concentrates. Beet pulp is rapidly becoming a common addition to the diets of endurance horses because of its high caloric and fiber content and its ability to hold large amounts of water.

Ideally, the endurance horse should get as many calories as possible from forage to avoid the complications of high-starch diets and muscle disorders. Forage in the hindgut also helps to delay the onset of dehydration during periods when the horse is working and not eating. The fiber holds water in reservoir. The average forage content of the diets for this group of horses was 78%, which is much higher in comparison to other types of sports horses.

## **Grain and Concentrates**

Commercial concentrates are designed to take the guesswork out of balancing forage deficiencies of energy, protein, vitamins, and minerals. Still, some horse

owners believe in keeping the feeding program simple by feeding straight grains. In this group, 32% fed some type of straight grain alone or with a commercial concentrate. The average intake of grain was 1.44 kg per day. Of those that fed straight grains, 67% fed grain plus a commercial concentrate; of the remaining 33%, three-fourths added some type of vitamin and mineral supplement, and only one-fourth fed grain alone. Commercial concentrates were by far the preferred method for addressing inadequacies of the forage with 89% feeding at least one type of commercial concentrate. The average intake of commercial concentrates was 2.27 kg per day. Most commercial concentrates are designed to be fed at a minimum feeding rate of 2.27 kg per day, which is exactly what the average intake was for this group of horses. When feeding lower than the recommended amount, the feed cannot provide the desired amounts of vitamins and minerals, and some sort of vitamin and mineral supplement is necessary.

### **Dietary Fat**

Because these horses were on the low end of the grain or concentrate supplementation spectrum, they required additional calories from other sources. Feeding added fat to endurance horses has become very popular for various reasons. Research on feeding fat has demonstrated a glycogen sparing effect of high-fat diets. High-fat diets appear to influence fuel selection towards using triglycerides for energy during work, and the body store of triglycerides is by far the largest. Adding fat to the diet also increases the caloric density so that less high-starch feed is needed. Fat gives the horse physical energy without increasing mental energy, like high-starch diets. At least 54% of the horses were receiving additional fat in the form of oil or rice bran. Rice bran was being fed to 27% of the horses and other fat sources to 41%, with 14% getting both rice bran and oil. The fat source of choice was corn oil, but others included dry fat, coco soya, and flax. High-fat commercial concentrates (>6% fat) are also popular with endurance riders, with 51% of the riders feeding some type. Interestingly, 92% of the East Coast riders were feeding a high-fat concentrate, while only 32% of the Central and West Coast riders were. This may be attributed to high-quality, high-fat feeds being more readily accessible in the Eastern regions of the country. Even with all the fat supplementation, the average fat percentage of the total diet was still only 2.3%, ranging from as low as 1.4% to as high as 6.9%.

### **Calories and Protein**

The amount of calories provided by the diet averaged around 24.1 Mcal digestible energy per day. The exact calculation of caloric intake is difficult to measure in those endurance horses that have ad libitum access to hay and/or pasture. The overall protein content of the diet averaged 10.2%, ranging from 6.2 to 15.7%,

depending greatly on the type of forage offered. The commercial concentrates used had protein concentration ranging from 10 to 14%, with the majority of the riders preferring the 10% feeds.

## **Supplements**

Balancing the diet is very important. One of the most important supplements for the endurance horse is salt because of the large amounts of salt lost in sweat. Surprisingly, only 35% of the riders offered horses free-choice access to salt. Again, regional differences were very distinctive because 75% of the East Coast riders offered salt, and only 16% in the West Coast and Central regions did. The higher humidity of the East Coast may be one reason for the difference; horses ridden on the East Coast may have a higher requirement. Only 5% of the riders feed a daily electrolyte, while all of them give electrolytes at a competition.

Use of other supplements varied; 35% fed an additional vitamin and mineral supplement to top off the commercial concentrate or grain. Selenium and vitamin E are of major concern for the endurance horse because of their importance in supporting muscle tissue. Only 19% fed a vitamin E and selenium supplement, but again regions were very distinctive. None of the horses in the West Coast or Central regions were being supplemented with vitamin E or selenium, while 67% of the horses on the East Coast were receiving it. The soils and consequentially the forages are very deficient in the East Coast and the Northwest. Only 16% of the riders were feeding some type of hoof supplement. Arabians have been bred to have strong hooves, and the limited use of hoof supplements attests to the hardness of their feet.

The trend in feeding the modern-day endurance horse leans toward a higher forage, higher fat, and lower starch diet. Riders appear to be astute in balancing inadequacies of forage with grain concentrates and supplements. Their willingness to put the horse first and do whatever is necessary to supply all of the nutrients needed was very evident in the evaluation of the individual feeding programs.