

## Feeding The Performance Horse

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The big question is “What is a performance horse?”. Certainly we would all consider racehorses and 3-day event horses as horses that are performing at high levels of exertion. Most would consider show horses, endurance horses, and others as performance horses. Absolutely, little Suzie's mother would consider her pony that is in this weekend's 4-H show as a performance horse. Therefore, the definition of a performance horse is pretty vague and open for a lot of subjective criteria. The best way to describe a performance horse is the value that the particular owners place on their animals, no matter what the activity level or breed. Therefore, we need to understand how to feed horses in general, without any real regard for putting a label on them.

When figuring out what to feed horses, meeting normal requirements for horses with a grain diet is a lot easier than many people think. The equation I use when talking to horse owners is as follows:

$$\begin{aligned} & \text{Age} + \text{Level of activity/function} + \\ & \text{Metabolism level} + \text{Hay/pasture quantity \& quality} \\ & = \\ & \text{Protein amount} + \text{Amount of extra calories needed} \end{aligned}$$

The **age** of the horse is important for determining the amount and quality of the protein in the diet. For weanlings, not only is higher protein important, but also milk proteins are a key part of the diet. Higher levels of protein of about 14% to 16% are required until the horse is about 2 years old. After that, protein requirements drop down to fairly low levels of about 10%. Protein levels stay low until horses hit old age. When horses get old and require more protein in the diet is up to the individual horse. Typically it happens when the horse can no longer maintain body condition on a normal hay and grain diet. Sometimes that happens at 15 and sometimes at 25. It really depends on the genetics, quality of life, regular deworming, etc. At this time, a Senior diet is recommended that provides higher levels of protein along with a high level of dietary fiber.

The **level of activity and function** of the horse also has a bearing on the overall diet. Horses in higher activity levels would be horses that are trained regularly and ridden on a regular basis as compared to “pasture ornaments”. The higher the activity level and amount of exercise, the more calories that will be burned and need to be replaced. The function of the horse would refer to broodmares and stallions that require extra calories and protein during certain cycles such as gestation, lactation and breeding.

Broodmares in the last 3 months of gestation require higher levels of protein in their diet (about 14% to 16%) equally important are the vitamins and minerals in the diet. About 70% of the foal growth occurs during this period. After the foal is born, the mare still requires a higher protein level, but more importantly they require substantially higher

levels of calories in the diet to replace calories used in milk production. Often, milk production requires more energy than can be replaced by feeding and the mare will naturally lose some body condition during this time period. Stallions require higher levels of protein and calories during the breeding season to replace nutrients and calories used in sperm production.

The **metabolism level** of horses is certainly an individual characteristic and can be somewhat breed specific. Thoroughbreds and Arabians are somewhat notorious to be “hard keepers” requiring more feed to maintain body condition. Morgans, Quarter horses, Warmbloods, and ponies are often “easy keepers” requiring very little feed. However, this does not hold true for all horses in those breeds. Often easy keepers pose more challenging feeding issues than hard keepers.

Horse feed diets are typically designed to be fed at rates of anywhere from 5 lbs. to as much as 8 lbs. of feed per day to a 1000 horse to provide all the necessary nutrients including protein, fat, vitamins, and minerals. For a hard keeper, feeding the minimum rate is not a problem and the real issue is consumption of enough calories in a safe manner. For easy keepers, they are always going to get shortchanged on minerals and vitamins, and potentially protein due to the limited amount of feed consumed.

**Hay and pasture amount and quality** are the most overlooked feeding issues with many horse owners. Often horse owners will concentrate on the grain portion of their diet while knowing very little about the nutrient quality of their hay or pasture. Fiber should be the basis of any horse's diet and should constitute a major part of the protein and calorie requirements of the horse. Legumes, such as alfalfa, provide higher levels of protein and calories and are typically more palatable to horses. Grass hays are lower in protein and calories and offer more options on types of hay.

When looking at hay, most people will consider quality based primarily on color. Color may indicate how the hay was harvested and stored, but is not a very good determining factor for overall quality. When looking at alfalfa, you want to see a lot of leaf retention and very few blooms. 80% of the nutrition in hay is in the leaf, so if the leaf is crumbling and falling into the bedding, the horse owner will not be getting very much of the nutrition they paid for. Grass hays retain leaf structure better than legumes, but are often harvested when the plant is overly mature.

The “roll in the hay” method works best when trying to assess the quality. As hay grows and matures, the plant produces more cellulose to support the stalk of the plant as it gets bigger. Much of this cellulose is in the form of lignin, which is not digestible in horses. By the nature of what lignin is supposed to do, support the plant by strengthening the stalk, it becomes very hard and “stemmy”. Therefore, immature plants would be low in lignin and soft to the touch. Overly mature plants would be high in lignin and not very comfortable if you had to “roll around” in the hay.

The best method to assess hay is to have the forages tested for nutrient quality. Understanding that pasture will change dramatically over the course of the season and

hay can vary from field to field and load to load. In order to make any forage testing viable, you need to take small samples from a number of bales. Also, you need to have enough hay storage to feed your horses for a while after you get your results back. Otherwise, the information will not be pertinent.

On the other side of the equation, **protein amount** is based upon all of the issues previously discussed. Protein is one of the most misunderstood and abused nutrients in feeding horses, yet it is what the horse owner identifies first when feeding grain. Over feeding protein is one of the most common occurrences when feeding horses. The easiest way to tell if too much protein is being fed to horses is if the horse is emitting an ammonia odor in the urine. Excess protein is converted to ammonia in the kidneys and excreted. Excess protein very rarely would cause a horse to get wild or uncontrollable. A slightly higher level of protein is required for horses in heavy exercise for rebuilding cellular structure lost in exercise.

Many horse owners will argue that their horses need a 12% protein grain ration rather than a 10% grain ration. When you consider the total diet, including hay, the total protein consumed changes very little. For example, a horse consuming 5 lbs of a 12% grain ration and 15 lbs of hay at 8 % protein results in an overall protein level of 9%. If that horse owner changes to a 10% grain ration and hay remains the same, the total protein content in the ration only drops to 8.5% from 9%. The more hay and pasture consumed, the less impact the grain protein content has on the total diet.

Protein in the diet is often confused for the **amount of extra calories** required by the horse to maintain body condition. Many horse owners who want to put additional weight on their horses feel that more protein is required. What is needed is additional calories in the form of a heavier concentration of carbohydrates or fat in the diet. However, research has proven that higher fat in the diet is a much safer way to add calories than more carbohydrates (corn, oats and barley).

The horse's digestive system, which is designed to ferment fiber on a continual basis, is often overloaded and stressed with large periodic grain meals. The results of over feeding grain or carbohydrates is often colic or laminitis (founder). A good rule of thumb is not to feed more than .5% of body weight per feeding of a grain based diet. That would be 5 lbs. for a 1000 lb. horse per feeding and you should allow at least 4 hours between feedings. Feeding hay before grain also helps to increase grain digestion in the small intestine and maximize the calories provided in the diet by slowing the rate of passage and increasing digestive juices. Fat can also be easily supplemented to the diet in the way of a feeding higher fat feed or feeding a fat supplement.

For the right half of this equation to work (protein + calories), I mentioned that feed companies will formulate protein, calories, vitamins and minerals to be fed at 5 lbs to 8 lbs per day to meet "average" requirements for horses on an "average" forage diet with an "average" metabolism. As we all know, there are not many things in this world that are average. For many horses, the forage part of the diet will meet the protein and caloric requirements. If you tried to get 5 lbs. of feed in these horses to meet vitamin and mineral

needs, they would become incredibly over-weight. That is especially true in large pasture, heavy hay areas. In these cases, you need to recognize that a normal grain diet will allow the owner to catch their horse, but nutritionally there is no advantage. Options such as a Lite diet or a vitamin/mineral supplement become the feeding choice. This can even be true with hard working horses that just have a slow metabolism.

A big concern for feeding performance horses is providing relief from **excess stress**. Often the results of stress are things that are sub clinical, or very small signs of problems that are hard to diagnose. Stress comes from many directions such as excess stall time, transportation, training, new environments, and exposure to sick animals, among other things. Management to reduce stress would include more breaks during shipping, more grazing time, vaccinations, etc. However, there are feeding methods that can also help. This is especially important to horses that may have tested positive for EPM.

First, as mentioned above, keep feeding grain to a manageable level. Do not over feed and feed as often as possible (3 times per day versus 2). Second, keep the feeding routine and diet as consistent as possible with no rapid changes, including the forage portion of the diet. Always take a minimum of 5 to 7 days to switch feed sources. Third, add nutrients to the diet to maximize the digestive system potential, such as the following:

- *Yeast cultures* have proven themselves to be highly effective in keeping the microbial population in the hindgut of the horse healthy by essentially feeding the microbes. Yeast will increase fiber fermentation, protein digestion and phosphorus absorption. Keeping the hind gut healthy is key to maintaining a healthy horse and could take as much as 60 days to get it functioning properly again if fermentation gets inhibited.
- *Probiotics* essentially are added to the diet to keep the microbial population in the hindgut on an even keel. There constantly exists a population of good and bad bacteria in the digestive system. As the horse gets stressed and pH and body temperature changes, good bacteria may die off and the balance can get shifted. Adding probiotics has been a proven method over the years of treating stressed animals. Constantly fed, probiotics have been proven to be dramatically better than dosing on irregular intervals.
- *Organic Minerals* can help the digestive system digest micro minerals up to 50% better than mineral salts such as sulfates and even higher for oxides. Micro minerals are added to the diet in very small amounts and are key nutrients for hair, hoof, and bone growth. They are also important to increase immune response when animals are stressed, improve heat resistance, reproductive performance, and energy utilization.
- *Digestive Enzymes* work on the same theory as probiotics, but in the small intestine. The addition of naturally occurring enzymes helps digest grains and protein in the small intestine where it is supposed to be digested.
- *Kelp Meal* is important in providing natural sources of organic minerals, especially boron, chromium, and vanadium that are needed in very small amounts to maintain structural soundness and improve protein energy utilization. These minerals are typically not found in other sources and are currently not allowed to be added to horse feed diets.
- *MTB-100* recently got a lot of press as an ingredient in feeds to help with the mycotoxin problem with the foal crop and pregnant mares in Kentucky. MTB-100 is a derivative of the yeast cell wall and chemically binds with the mycotoxins that are often found in fiber

sources and neutralizes them. Research has shown that mycotoxins can be present in as much as 80% of the hay crop. The mycotoxins are typically not in large doses, but at low levels that can cause a slight decline in the appearance, condition and performance of the horses. They can also eventually be a root cause for colic.

- *Biomos* is a similar product to MTB-100 and even has some mycotoxin binding ability itself. Predominantly, *Biomos* attracts and binds with pathogenic bacteria like *E. coli* and *Salmonella*. Again, this is important in stressed horses where the good bacteria get challenged or die off due to changes in pH or body temperature.

Therefore, performance horses or backyard horses are really not much different. Energy requirements typically are a bit higher for horses at some level of activity, other than standing around, requiring either more feed or higher fat levels in the diet. In cases of heavy activity, protein needs will be slightly higher than similar horses with less activity. Both the calorie and protein issues may influence feeding frequency or supplementation. But essentially, you don't need to have a horse in the Kentucky Derby or the Olympics to feed and recommend improving the diet. Stress, mycotoxin problems, pathogenic bacteria, and insufficient or excessive feeding rates can happen with any horse on any farm.

As with anything, cheaper is definitely not better.