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# FEEDING THE FOOT: NUTRITION FOR EQUINE HOOF HEALTH

## THE RECIPE FOR HEALTHY HOOVES

Your horse's diet plays a crucial role in the quality and durability of the horn that makes up his hooves. Horses require certain nutrients in specific amounts and ratios to grow and maintain strong hooves. However, even the perfect diet is not enough by itself to grow good feet—several other factors come into play. Management, exercise, metabolic rate, hoof care including trimming and shoeing, overall health, genetics, and climate (moisture levels, in particular) can all affect the appearance and strength of horses' feet—and not always for the better. The bottom line is hoof health requires a very holistic (whole horse) approach.



## FEEDING THE FEET: INGREDIENTS THAT BUILD STRONG HOOVES

### ENERGY

Starting on a very basic and fundamental level, horses grow strong and healthy hooves by consuming enough energy. Here's why this is so important: A horse that burns more calories than he consumes will save these precious energy-packed calories for vital organs and bodily functions, while external structures such as hooves and hair get the short end of the stick. Balance, however, is key. A horse that consumes an energy-rich diet that is too high in the nonstructural carbohydrates starch and sugar is at an increased risk of developing laminitis (a debilitating hoof disease that occurs when the laminae suspending the coffin bone within the hoof capsule fail). The same can be said of a severely overweight horse; obesity increases the chance of developing metabolic disturbances similar to diabetes in humans, which can also lead to laminitis.

### PROTEIN

The healthiest horses have balanced diets, meaning they receive all the necessary nutrients in correct amounts and ratios, with no imbalances, excesses, or deficiencies. Certain ingredients affect hoof health specifically, and protein is high on that list. This is primarily because the hoof horn is composed of an insoluble protein called keratin.

"Keratin provides the unique combination of strength, hardness, and flexibility of the hoof capsule," says Wagner, who also runs an equine nutritional consulting business from her home base in Cheriton, Virginia.

Like all proteins, keratin is made up of amino acids, which the horse digests and uses to build and maintain various body tissues. Specific amino acids exist naturally in the hoof and help ensure its proper structure and function. These include cystine, arginine, leucine, lysine, proline, serine, glycine, and valine, as well as lower amounts of methionine, phenylalanine, and histidine. That's a lot of ingredients to remember, so a good recommendation is simply to feed a diet containing all 10 essential amino acids, because adding only certain ones to the diet has the potential to throw it off balance. What makes certain amino acids "essential" is the body's inability to produce enough of them naturally. The horse must, therefore, ingest them in his diet in the form of protein. While protein is essential for hoof health, beware of excesses. Overfeeding protein is a waste of an expensive ingredient and can be detrimental in hot weather because digesting it generates extra body heat and increases water requirements. This can be problematic for high-performance horses that travel and exercise in hot, humid conditions, because these athletes are already predisposed to dehydration and heat stress.

### FAT

This nutrient by itself doesn't improve hoof quality. However, it contributes greatly to energy intake, indirectly supporting hoof health. Feeding fat also helps maintain a barrier in the hoof, keeping bacteria and fungi out. Fat is a safe and effective energy source for most horses and benefits many structures beyond the hoof.

*continued on page 2*

## BIOTIN

Nutritionists consider vitamin B7, better known as biotin, to be the single most important vitamin for hoof health. Biotin contains sulfur, an element that contributes to the strength of the bonds between collagen strands in connective tissues, including in the hoof wall. Several studies going back decades have shown biotin to be effective at restoring the strength and elasticity of a hoof wall with structural defects (Kempson 1987; Wintzer 1986). The good news is biotin exists naturally in grass, concentrates, bran, and yeast, so your horse is probably already getting the recommended dosage of 15-20 milligrams/day (that's for the average 1,100-pound horse). Because biotin is a water-soluble vitamin (as opposed to a fat-soluble one), the body simply excretes any excess, eliminating the risk of toxicity and making it very safe to feed. Some horses, however, respond better to biotin supplementation than others.

## GUT HEALTH

Another ingredient in the healthy hoof recipe that you might not immediately consider is the beneficial bacteria in the digestive tract. "Supporting a healthy gut microbiome is critical because the microbes in the hindgut produce B-complex vitamins, which may assist with blood flow to the hoof," Taylor says.

Wagner even recommends considering a general gut health supplement. "If there are gastrointestinal issues in digestion and absorption or with microbial dysbiosis (imbalance), then the utilization of the nutrients fed is also reduced," she says.

## MINERALS

Of the key minerals, zinc plays an important role in keratinizing and maintaining hoof strength. Research has shown that weak hooves are sometimes associated with low zinc levels in the blood (Harrington et al., 1973). Horses also need calcium to bind cells to each other in the horn. Feeding the correct calcium-to-phosphorus ratio is a tenet in equine nutrition, because excess phosphorus can interfere with calcium absorption and cause an array of health problems. It's important when considering hoof health, because a lack of calcium can weaken the hooves.

Indeed, just like amino acids, "minerals function in groups," Taylor says, "and changing the amount fed of one or two can disrupt the absorption and utilization of other minerals."

Feeding too much zinc, for example, will compromise copper and iron metabolism. Selenium helps build strong hooves, but excessive amounts actually compromise the horn's quality, as can too much of the amino acid methionine. It's all about finding an equilibrium in the nutrients.

"Always make sure the horse's diet is balanced," Wagner urges. "An unbalanced diet can negatively impact many areas of health and condition, including hoof health."

## WHEN TO TURN TO SUPPLEMENTS

Owners, veterinarians, and farriers have reported anecdotally that many nutritional supplements help with brittle feet and hoof cracks, but independent scientific research only supports those containing biotin and methionine. In 1990 a research team from the University of Edinburgh, in Scotland, added a biotin/methionine product (Farrier's Formula) to the diets of 18 horses with either hoof cracks or flat, bruised feet. All the study horses had improved hoof horn structure (as assessed on a microscopic level) six weeks after supplementation began. These changes were visible to the naked eye, as well. Once they'd grown quality horn, none of the horses relapsed during the two-year experimental period.

Taylor and other nutritionists usually find that horses with good feet don't tend to show much improvement with supplements, most likely indicating that their basic diet is already meeting all the hooves' needs. This suggests that your money is best spent making sure your horses' diets are complete and balanced and feeding nutritional hoof supplements only to those with weak or cracked hooves. And, as always, consult your veterinarian or equine nutritionist to discuss adding any supplement to your horse's diet.

## TAKE-HOME MESSAGE

"Horses are individuals and, whether they are shod or barefoot, all have individual hoof health needs," Taylor says. "There is no 'ideal' diet that should be applied to every horse, but every owner should look carefully at the hoof in the context of overall health, environment, exercise, and diet."

And keep in mind that today's diet is tomorrow's hoof—so give your horse the best chance at long-lasting health and soundness.

### Augusta Co-op Solutions

#### Farrier's Formula, Double Strength

The number one recommended product by farriers for twelve consecutive years. Contains vitamins, minerals, and amino acids. Developed to provide the essential nutrients needed to enable horses to build strong structural and connective tissue proteins in the hoof. Developed by a veterinarian based on the scientific testing of blood collected from hundreds of horses. This double strength formula provides twice the concentration compared to the original formula. Helps to provide twice the number of daily doses compared to the original. Can be fed to competition horses.



SKU - 049023



# HOW TO FEED PERFORMANCE HORSES ON A BUDGET

GET TIPS FOR ENSURING YOUR HORSE GETS THE NUTRITION SHE NEEDS WITHOUT EATING ALL YOUR MONEY.

## Q. DO YOU HAVE ADVICE FOR THOSE OF US FEEDING PERFORMANCE HORSES ON TIGHT BUDGETS?

**A.** In my job as an equine nutrition consultant, clients commonly come to me with long lists of products they're feeding their horses. This is particularly true of my performance horse clients. When added together the cost of these products is significant, sometimes exceeding \$5 per day. This kind of budget is not realistic for many who own performance horses. So, your question is a good one.

My advice is to start at the foundation of your horse's diet and to be fastidious about management. Don't scrimp on quality forage—it's the best investment for your feeding dollars. The more you can feed your horse like a horse, the less likely you will incur expensive veterinary bills associated with conditions such as gastric ulcers and colic and the less reliant you will be on concentrate feeds. Make sure the forage is clean and as free of dust as possible, as this will protect airway health. Feed as much forage as you can to honor your horse's digestive tract anatomy and physiology.

Forage, however, cannot provide everything your horse needs all year round. Even if your forage source is pasture, at some point in the year its quality and abundance will likely drop. Neither pasture nor hay typically provides adequate levels of trace minerals, might not provide adequate vitamins such as vitamin E and, depending on the individual horse and discipline, might not provide adequate calories. This makes a concentrate, commercial feed, or a balancing supplement necessary.

Select a feed you can offer properly per the manufacturer's directions. If you're only going to feed a couple of pounds a day, don't be fooled by the fact the performance or senior feed is significantly cheaper per bag than the ration balancer. Those feeds have daily feeding rates typically in the range of 0.5 to 1 pounds per 100 pounds of body weight. Feeding less than this will leave your horse with key deficiencies that over time might cause health issues and have you reaching for hoof supplements, coat products, and additives that support topline development. Paying more per bag for the ration balancer and feeding it per directions will likely save you money in the long run.



## OTHER ESSENTIALS INCLUDE:

1. Fresh, clean water;
2. Salt provided daily, ideally in the feed, with free access to an additional source;
3. Omega-3 fatty acids for horses not grazing pasture for 12 or more hours per day; and
4. Possibly additional vitamin E for those same horses.

Vitamin E supplementation is relatively expensive, and not all horses require it. So, put some money toward getting your horse tested to see whether supplementation is necessary. Horses with deficient or marginal levels of vitamin E in their bodies are at risk of developing conditions such as vitamin E deficiency muscle myopathy and equine motor neurons disease, so this is an investment worth making. Ask your veterinarian to take blood during an already-scheduled visit such as spring or fall vaccinations or during a dental check to save on an additional farm fee.

Whether your horse is going to need supplements depends on his individual needs. Does he have underlying health conditions that need additional support, such as allergies, or need digestive tract support? Do you have the budget remaining to add a joint supplement if you want one? If you decide to add other products, have a clear reason for adding them. Don't add products just because someone else in your barn is doing it for their horse and seems to be having good results. Their base diet might not be as solid as yours, or their horse's situation might not be the same as yours. Also, don't feel bad if you don't have the budget to add more. Very little research exists on the efficacy of many supplements. If possible, try to use products backed by research so you have some peace of mind that the products do what they say they will.

*Clair Thunes, PhD*

# DOES SUGAR MAKE HORSES ANXIOUS OR HYPER?

Researchers on more recent studies have also evaluated diet's effect on behavior. In a 2019 study Bulmer and colleagues reported a change in the hindgut (the cecum and large colon, or large intestine) microbiota of ponies fed a high-starch diet. The ponies were also more alert, nervous, and reactive in novel situations, and their heart rates were elevated when compared to ponies on high-fiber diets. Destrez and co-workers found similar results in 2015; horses fed high-starch diets presented with intestinal discomfort and displayed negative behaviors and elevated stress when compared to those on low-starch diets.

There are a few theories on why diets higher in fiber and/or fat and lower in more digestible carbohydrates might influence behavior. Horses on diets high in more digestible carbohydrates are prone to ulcers and hindgut acidosis. Hindgut acidosis occurs when, instead of being digested in the small intestine, starches reach the hindgut and are fermented by microbes. Signs of this condition include poor performance, poor attitude, and mild colic.

Diets high in starch can also negatively affect the microbial population found in the hindgut, which will negatively affect hindgut function and performance. This can lead to problems with the "gut-brain axis." The gastrointestinal tract releases around 20 different hormones, including several neurotransmitters. Disruptions in the release of these hormones can cause "negative" behaviors, including hyperexcitability and irritability.

Glucose is a sugar that easily crosses the blood-brain barrier. Elevated glucose levels, observed in horses consuming "high-starch" diets, are associated with increased dopamine production. Elevated dopamine can lead to elevated awareness or hyperexcitability. Horses on diets higher in fiber and/or fat show more consistent and lower blood glucose levels.

Research is ongoing on how diet might affect behavior and why. One should remember that dietary changes alone, without consideration of training and management, will not "cure" the anxious horse. It is just one part of the equation. For some equine athletes, such as Thoroughbred racehorses that must rapidly replace glycogen stores in skeletal muscle, a higher-starch diet is beneficial.

Decisions to transition to a diet lower in "sugar" should be made after consulting with your veterinarian and qualified equine nutritionist. Your feed company can be an excellent resource, as it will have an equine nutritionist on staff who can answer your questions. You should also consult reputable resources for additional information.

It is important to make sure you are meeting, and not exceeding, your horse's caloric requirements. So, adding fat to the diet will require a decrease in the soluble carbohydrate sources. This is not as easy as just replacing on a pound of feed basis, since fats have more than two times the calories of carbohydrates per pound. Dietary transitions should also be made slowly, ideally over about two weeks, so the digestive system has time to adapt. Diarrhea and odd-looking feces are indications the transition is being made too quickly.

*Janice L. Holland, PhD, PAS*

## Augusta Co-op Solutions

### Triple Crown Equine, Low Starch

Formulated specifically for mature horses, Triple Crown Low Starch is a pelleted low starch and sugar (NSC) feed for horses requiring a lower diet for metabolic reasons or for horse owners seeking calmer behavior from horses. Featuring fewer carbohydrates than hay and pasture, Triple Crown Low Starch can be used as a complete feed to replace all or part of the forage portion of the diet. This feed is also suited for those who tend to have allergies, ideal for HYPP horses as the feed contains a low potassium level and works well for senior horses in winter in order to avoid the bricking of textured feeds.



SKU - 3004458-206



# AUGUSTA COOPERATIVE FARM BUREAU, INC. UNVEILS NEW LOGO



Augusta Cooperative Farm Bureau, Inc. (Augusta Cooperative) embraces change while reaffirming its commitment to agriculture, business and community with the unveiling of a new logo. The logo debut marks the fourth revision of the Augusta Cooperative logo during the organization's 93-year history.

Created during a four-month strategic rebrand, the new logo is an evolution of previous logos while also incorporating growth elements. A blue and green color palette maintains the brand's heritage with fresh modern hues.

A unique logo graphic element tells the Augusta Cooperative story. In the center of the graphic, a blue "A" represents "Augusta." A green leaf growing up from the "A" conveys Augusta Cooperative's commitment to agricultural excellence while also illustrating its growth. Today, Augusta Cooperative manages four divisions

including agronomic services, feed production and sales, small engine services, and retail sales.

The outer lines of the logo's graphic depict an upward facing "C," representing "Cooperative" and the organization's commitment to local farmers, members, and the community in which it does business. As the "C" rises upward, it forms a shield around the "A" and the leaf, representing the bond that patrons form with Augusta Cooperative's knowledgeable staff. The shield further symbolizes protection, strength, stability, and as an icon of the past, it also symbolizes the nearly 100-year history of Augusta Cooperative.

"Our new logo signifies both Augusta Cooperative's rich history and our continued commitment to the agricultural and the rural communities we serve," explained Kevin McLaren, General Manager of Augusta Cooperative. "It pays tribute to our legacy, while looking to our future."

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## EVENTS / CALENDAR

### FEED, ANIMAL HEALTH & FARM SUPPLY FALL BOOKING SALE

**AUGUST 15 - SEPTEMBER 3, 2022**

Take advantage of the huge selection and best prices of the season on all of your feed, animal health and farm supply products!

Contact your sales representative, store manager or feed mill to place your order.

Visit [AugustaCoop.com](https://AugustaCoop.com) for more details.

### BACK TO SCHOOL SALE

**SEPTEMBER 12-17, 2022**

Staunton location only.

Great deals on the top brands on clothing, boots and accessories.

Visit [AugustaCoop.com/events](https://AugustaCoop.com/events) for details!

### CUSTOMER APPRECIATION

**OCTOBER 10-15, 2022**

All store locations.

Visit [AugustaCoop.com/events](https://AugustaCoop.com/events) for details!

### SMALL ENGINE SALE & OPEN HOUSE

**AUGUST 26 & 27, 2022 | 8 AM – 5 PM**

Augusta Co-op Small Engine Shop

(1205B Richmond Road, Staunton, VA - across from Sheetz)

Huge deals on SCAG, Husqvarna, STIHL and Oregon power equipment. Call or order ahead, or stop by to talk to our knowledgeable staff about all of your fall and winter needs.

Vendors on-site.

### ROAD TO THE RING

**OCTOBER 8, 2022 | 8 AM – 5 PM**

Augusta Expo Coffey Pavilion (277 Expo Rd, Fishersville, VA 22939)

A hands-on experience designed for all 4-H/FFA Livestock Showmen. Presenters will inspire you to obtain the skills & techniques needed for success in the show ring! Become a better livestock showman, marketer, herdsman and learn the latest in nutrition and overall animal health.

RSVP required at [AugustaCoop.com/events](https://AugustaCoop.com/events)





#### CLICK HERE TO FIND HAY SUPPLIERS IN THE VALLEY



Sourcing horse hay from a local grower can be a convenient option. Proximity for delivery and price can be two reasons equine stable managers choose to work with local growers.

Scan here to view a current list of known hay suppliers in the Shenandoah Valley.

(Augusta Co-op does not recommend any specific hay supplier)

<https://www.augustacoop.com/resources/hay-directory/>



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**WEDNESDAY, SEPTEMBER 7, 2022  
5:00 PM - 8:00 PM**

Augusta Co-op Equine, Wine & Dine + Product Booking IS BACK! Augusta Co-op has secured the best prices of the year on fencing, equine supplies, supplements, animal health items, feed, equine related farm equipment and more! Vendors on site! This organized event, works similar to a 'pre-order', or 'booking' and is not available in-store. Plus, hear from industry leaders on innovation & technology during your complimentary dinner and wine sampling. Huge door prizes, free goodie bags and more!

5:00 PM – 6:00 PM – Vendor booking / Wine tasting hour

6:00 PM – Dinner served

6:15 PM – Seminar begins

RSVP here (<https://www.augustacoop.com/events>)

by August 31 to attend the event

Wednesday, September 7, 2022 from 5 PM – 8 PM  
at the Virginia Horse Center Foundation (Mezzanine Level).

(Limited seating)



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