

"I have constantly been both praised and criticized for my refusal to stop learning, changing and evolving. Some people appreciate it when I admit to my mistakes. Others use it against me. I take the good and the bad words in stride; I am who I am, and people don't motivate me anyway- it's the horses! As for the horses in my care, my motivation comes not from my success stories but from my failures. When I look one horse in the eye and realize that I am not good enough, it dominates my every thought- the success stories are forgotten." Pete

The very best hoof care can only go so far. We must properly feed our hooves if we want the best out of the horse and we must properly feed our horse if we want the best out of our hooves. Over the years I noticed that no trim mechanics could grow healthy walls, laminae, soles or frogs on some horses. This led me to Katy Watts www.safergrass.org and her studies on varying sugar levels in grasses and hay. When I realized that constant carbohydrate overload was destroying the hooves of so many horses, I became a "sugar freak"; an expert at finding the "hidden" sugars in horses' diets and convincing horse owners to take the necessary steps to eliminate them. My trimming changed very little, but the results I was getting improved dramatically when I started to pay more critical attention to the diet.

Grass became 'the bad guy' for me; a distant memory for many of the horses in my care. For some horses this is truly the way it must be, but I've always noticed that some pastures support herds of horses in perfect health, while another pasture two miles away seems literally toxic to any horse that lives there. I've noticed the same thing in horses at boarding facilities with little or no access to grass. I would find myself at one boarding facility preaching that a lack of exercise was causing the sickness and weakness in their horses, but then drive a few miles to another (seemingly identical) situation that featured horses in extraordinary health, with beautiful feet- in spite of spending 12 hours in the stall every day. I didn't talk about these observations very much, but they have constantly gnawed at my gut instinct- I was missing a critical piece of the puzzle.

I had several pastures within my clientele that produced poor hooves no matter how they were previously shod, and the problems persisted no matter how I trimmed them. The hoof walls were weak and peeling apart in layers. There was no white line integrity and I could not grow well connected walls. The soles were thin and thrush was common. I would show up at 5 weeks to trim the feet and it looked like I should have been there 4 weeks ago. Again, it was easy to blame the excess sugar consumption and no doubt that is still a big issue. But it was hard to ignore the fact that there were other pastures in the same area that supported nice

hooves in spite of that same free access to 'all you can eat' green grass.

Finally I started testing the grass in those problem pastures and found that there was virtually no copper or zinc in the horse's diet. *[Copper supports enzymes that form the strengthening cross-links between collagen and elastin molecules in connective tissue. Deficiencies lead to abnormalities in bone, cartilage, tendons, ligaments, and arterial walls among the most dramatic consequences. In horses, copper deficiency has been linked to uterine artery rupture in mares, a fatal complication of labor. Copper deficiency is known to cause developmental bone disease in foals. From research in other animals we also know that copper deficiency has adverse effects in hair quality. Although it hasn't been studied in horses, remember that the ingredients and growth mechanisms for hair and the hoof are virtually identical.*

Zinc performs a host of functions in the body. Structures on proteins called zinc fingers allow them to bind to DNA. Zinc fingers also influence the folding and structure of proteins. In enzyme systems, zinc is essential for pigment formation, antioxidant function, transport of carbon dioxide in the blood, bone building and remodeling, insulin production and release among others. Eleanor Kellon, VMD]

I bought an over-the-counter hoof supplement that had the highest zinc and copper levels I could find, and it improved the hoof quality of every horse in those pastures.

But there was still room for improvement- I enrolled in Dr. Kellon's basic course "NRC Plus" www.drkellon.com. I firmly believe that every person responsible for taking care of horses should take this online course. It will teach you the relationships, roles and importance of vitamins, minerals, proteins, electrolytes, how the horse utilizes food for energy and the basics of what makes it tick. The course demystifies the feed labels, forage analysis and teaches you how to really provide for your horses' needs.

During this course, when I looked back at my pasture and hay analysis from the past, it became clear that the lack of copper and zinc were the least of my problems. In my area, the grass, hay, water (and even the mineral blocks I was recommending) consistently have toxic levels of iron. *[Excess iron cancels the absorption of copper and zinc- even if there is an "adequate" amount of those minerals available. Excess iron has many effects, including predisposition to infection, a predisposition to arthritis and increased risk of tendon/ligament problems, liver disease and altered glucose metabolism – including insulin resistance and overt diabetes. Eleanor Kellon, VMD]*

High body iron levels drive insulin resistance, and vice versa. This may explain why the high sugar content of the grass had an exaggerated effect on the horses living on the high-iron pastures and water sources. I was first called to each of these facilities because of acute and/or chronic laminitis, and the problems persisted even with grazing muzzles or dirt paddocks with hay (from the same region). Now I understand why.

The most frustrating part is that after taking that class, I can now read the labels on equine feeds and supplements and compare them to the horses' actual needs. The deception is sinful. Horse owners buy a supplement and/or commercial feed and think they have covered all the bases of nutrition. They read the label and see, "It's in there": Zinc, copper, biotin, calcium, phosphorus.... All the things they are told their horse needs for optimal health and performance listed in ppm (parts per million) or percentages, but they don't know what it means. They put their faith in the manufacturer. In most cases, the actual levels provided are only a fraction of what the horse needs.

One very popular daily supplement I found at a customer's barn was 93% salt and had 3ppm of zinc proudly printed on the label. Since zinc was listed (along with a dozen other minerals in similar amounts) the owner thought she had the trace minerals covered. Her 880 pound horse would actually have to eat 220 pounds of this supplement per day to get the minimum NRC requirement for zinc! (Needless to say this would kill the horse.) Deception- and our horses are suffering for it.

To make matters worse, if a supplement does not complement the grass, hay and other feeds it is worthless or even toxic. Understand this all varies- every pasture and hay field has a unique mineral profile and will thus have unique supplement needs. You should test each of your horses' food sources and consider the entire nutrition profile together. The horses with little or no access to green grass are subject to the same problems as well- it all depends on the soil in the hay field. Additionally, the hay-drying process eliminates vitamin E and essential fatty acids so important for skin (hooves) and for fighting inflammation. These must be supplemented if the horse has limited access to green stuff.

At boarding facilities, where hay and grains provide most of the calories, I'm seeing another very common scenario. The horses are often getting too much calcium and not enough phosphorus. It is important that they are balanced in a 2:1 ratio respectively. Alfalfa and in some areas even grass hays tend to have a ratio of 5+ :1. This creates a functional lack of phosphorus that can lead to angular deformities in foals and bone loss in older horses. This does not mean that you should blindly supplement phosphorus. Too much phosphorus also robs the horse of calcium. You must test the forage!

Excess calcium could also make magnesium less available to the horse. *[The symptoms of inadequate magnesium are the same as those of excessive ionized calcium. These include irritability, hypersensitivity, muscular symptoms from twitching to spasm, with a*

potential for GI symptoms and heart irregularity when severe. Horses with moderate magnesium deficiency are often misdiagnosed as EPSM. Other magnesium responsive clinical symptoms I have seen are gait disturbances, including stilted gait, base wide gait behind, difficulty controlling the hind end when turning and reluctance or inability to canter. The magnesium deficient horse is not a happy camper! Eleanor Kellon, VMD]

Salt is another very common deficiency I see everywhere I go. Most horse owners think that if they provide a salt block, the horses' sodium needs are met. In truth, horses do not receive adequate levels of sodium by licking a salt block. One sedentary horse would have to consume over 2 pounds (an entire stall sized brick) in one month. If he was working, he might need 2-4 times more than that. Salt is ideally provided in a loose form. Most horse owners don't realize how critical it is for their horse's sodium needs to be met. *[Sodium is essential for absorption of many nutrients, as well as their entry into cells (including glucose), essential for the normal functioning of all nerve and muscle tissue. Sodium is also the major regulator of water balance in tissues. In addition to "holding" water in the tissues, sodium is what the brain "reads" in determining when to trigger thirst and when to regulate the amount of sodium, and therefore water, the body excretes in the urine. If sodium intake is too low, the kidneys will actively excrete potassium and save sodium, even if blood potassium levels drop below normal. This is a very, very common mistake made when supplementing performance horses.*

Insufficient sodium inevitably leads to some dehydration. The brain reads sodium levels in the cerebrospinal fluid. The cerebrospinal fluid in turn is a filtrate of blood. Blood levels of sodium will be maintained by "stealing" sodium from the extracellular fluid. This leads to the decrease in skin elasticity that is familiar sign of mild to moderate dehydration. The rule of thumb is that as little as 2 to 3% dehydration can lead to a 10% drop in performance. However, excessive intakes need to be avoided. Eleanor Kellon, VMD] Again, actually testing and supplementing specific amounts is optimum.

These are only a few small examples of many. Horses need to consume each nutrient in adequate amounts and usually in balance with the amounts of several other nutrients. This is not just about growing healthy hooves, either. Balanced nutrition profoundly effects attitude, immune function, strength, endurance, recovery; actually every aspect of health and performance. If your horses are having problems of any kind, you can bet there is a nutritional component. So far, every time I have had troubles growing healthy feet and have tested the forage, I have found significant mineral ratio problems and/or deficiency- every time. The nutrition balance may be all or part of your horse's problem, whether you are concerned about a training issue, recovery from an illness or carving 2/10 of a second off your lap time.

The best news is that feed testing, balancing and supplementation saves most horse owners a considerable amount of money (Now why haven't the feed companies told us about this?) but you will be

required to think, rather than just blindly throwing your money away. Too many horse owners spend hundreds of dollars a month to keep their horses constantly on the brink of laminitis by feeding buckets of feed and random supplements- “just in case” the horse is missing something in his diet. Why not find out exactly what he is missing and just buy that?

Here's how to do it:

- Take samples of your hay and grass. Send them in for testing to www.equi-analytical.com (read the directions for sampling on that site). Your analysis will be emailed to you in a few days. Choose the 'Rider' package for \$35 as a start for most situations (a more comprehensive package is available for \$79)
- Now what? You will get back a long list of nutrients that will probably look like Chinese algebra to you. Here are some options: 1) (good) Join the Yahoo group EquineCushings, read the introductory information and then ask for help (there is incredible help to be found there) [For excellent help with hoof trimming issues, also join the Yahoo group BarefootHorseCare]. 2) (better) contact Dr. Kellon www.drkellon.com. She does consultations for \$100- a real bargain if you ask me. 3) (best) Enroll in the NRC Plus course (\$210) and learn to do it yourself.
- Once you have designed your custom supplement, you can order each ingredient separately for maximum cost saving. Local mills that actually mix their own feed, or general livestock supply stores, can often get you bags of the most commonly needed minerals. For instance, a 50 pound bag of magnesium oxide for around \$10 will likely outlive your horse. For smaller amounts, you can try Uckele Health and Nutrition, www.uckele.com (or call them at 800-248-0330), or Gateway Products has many single ingredient products available www.buygpdirect.com. It depends on what you need, but most horse owners are reporting a total cost of 20-30 cents per day. Another option that saves you time and labor, and still will reduce your overall supplement costs, is to have the minerals you need custom mixed for you. Uckele (above) and Horse Tech, www.horsetech.com, will do this service for the individual owner.
- Feed the supplement to your horse daily. This is usually easy if the horse is also on feed- the actual volume of the supplement is usually very small. If the horse is only on hay or grass, you might have to get creative. Mixing the supplements into a spoonful of unsweetened applesauce or in a small amount of beet pulp mash and oats will usually do the trick.

Now you have all the tools.... Just do it- yesterday!

“I highly recommend that if you take the ‘NRC Plus’ course, have your own forage analysis in hand (or for hoof professionals, the analysis of your customer with the worst hooves). That way it is not just a mountain of science and theory. I was floundering with the information overload until I started balancing the diets for real horses that I knew personally. Then it immediately started snapping into focus.”



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