The hungry foot

Understanding the nutritional needs of the Thoroughbred's foot is the first step toward healthy, strong hooves

By Fran Jurga

The thoroughbred is revered for many attributes: speed, heart, endurance, courage, and beauty. But a strong hoof has never been on the list of the breed's strong points. Regardless of environment and geography, the breed never shows up on any top ten lists when it comes to horse breeds with strong hooves.

It is easy for breeders or trainers to throw up their hands and mutter, "What do you expect? Of course he has bad feet, he's a Thoroughbred!"

It is more difficult to tackle the problem of building a strong foundation under horses to prolong their usefulness in breeding program or to eliminate foot problems as a limiting factor in sales prices or performance.

Management of the foot is well-documented:

- Tack shops are stocked to the rafters with moisturizers, toughteners, sealants, and oils;
- Horseshoe manufacturers have developed more supportive race plates and shoes, adhesives, bar shoes, and boots;
- Therapists offer treatments to stimulate blood flow or ease the pain of stinging soles; and
- Veterinarians use digital radiography to analyze bony alignment and identify coffin joint problems.

But many trainers and breeders look to nutrition as a way to work on hoof quality from the inside. So, once again, an industry was born of a need.

In the mid-1980's, Life Data Labs in Alabama brought Farrier's Formula, the first special-needs nutritional supplements for horses, to the market.

The success of this single product led to the realization that perhaps there is something to the notion of "feeding the foot." Dozens of manufacturers followed suit, and a new set of shelves had to be built in the tack stores to accommodate all the hoof supplements that followed Farrier's Formula to market.

Feeding the foot

While the nutritional needs of the average horse are well-documented, the needs of an isolated body part, the foot, are not. Just as each trainer and breeder ultimately develops a unique feeding program for a group of horses, the needs of the foot are separate from the rest of the body. Some authors describe it as a separate metabolic unit, an energetic machine of circulation and horn growth that utilizes nutrients and water o keep a strong set of hooves under the horse. When that metabolism fails, or is compromised, caretakers must go back to the drawing board of their nutritional program and figure out what is not working for a particular horse and his hooves.

Nutrition is a tricky business. A feeding program feeds the whole horse, and the horse's overall health, energy and digestive system processes are the first and foremost goals of the feed, hay, supplements, and water given to each horse. Trying to divert a given group of nutrients to the hoof is just not possible; imbalance of nutrients in the horse's diet will create more problems than it will cure. Adding a particular mineral or vitamin to help a hoof problem will mean that the additional ingredient will affect every system of the horse to which it is carried by the blood's circulation. Equine nutrition is not a simple science.

The complexity of nutrition science has not impeded the attempts of science and industry to try to understand more about the hoof's nutritional needs. Each year, new developments are published with one limiting factor: Science still does not understand exactly how the hoof works.

Researchers are still analyzing the complex structure of the hoof wall and the metabolism of energy in the hoof.

The recent tragedy of 2006 Kentucky Derby Presented by Yum! Brands (G1) winner Barbaro was a case in point for all we do not know about the hoof. While laminitis, the condition that ultimately took his life, is a disease, researchers who are struggling to understand how this disease ravages the hoof are hampered by not completely understanding what the normal function of the hoof is.

Laying the groundwork

A horse compromised by weak feet or quarter cracks may be a riddle with answers to be drawn from a combination of genetics, management, stress reactions and nutrition. But when it comes to nutrition, be prepared to confront an evolving science. That is the bad news. The good news is that the science is marching forward each year.

Breeders and trainers who keep an ear to the ground of nutrition science will find that there may not be a lot of new ways to help manage foot problems through feeding and supplementation but that the process is becoming much more specific and pinpointed for horses of different ages or uses.

The first thing that nutritionists advise when a horse is experiencing hoof problems is to look at the current diet being fed and to look at the horse's history:

- Has the hoof quality changed?
- Are the changes related to seasonal cycles in the horse's move from track to track or changes in bedding?
- IF the horse is at a farm, has the season been excessively wet or dry, cold or hot?
- Are there pasture management changes that may have affected the horse?

Most important of all, the caregiver must look at the hoof problem and decide if this is a reaction to a new problem or if the horse's feet always have been weak and susceptible to cracks or other problems.

Hoof problems can rarely, if ever, be considered a problem to be solved by nutrition alone. Expert farrier care, exercise, and the horse's overall health must be analyzed to partner with nutritional support to help the horse grow stronger, healthier hooves.

Trainers and breeders know that you can feed the same hay, water, and oats to a shredrow of horses and see different results. When horses have hoof problems, the second place to look is at the whole horse. Nutritional success in a horse depends on optimal absorption of nutrients. Horses with dental or digestive problems cannot receive the full benefit of their feed. Likewise, healthy hooves depend on healthy circulatory systems and the delivery of nutrients to the foot. Horses that are stall bound while recovering from injuries or otherwise receiving limited turnout or exercise ma not be receiving the full benefit of their feed, regardless of the quality of the individual components.

When a trainer is staring at a four year-old with a quarter crack or shelly feet, he or she does not really want to hear the next important factor in hoof nutrition: Relative foot quality is, to some extent, determined by a cumulative factor. To some extent, hoof tissue is similar to bone and skin: How it attaches to the bone has been in place since fetal development. Strong attachments and efficient growth may have genetic components and may have been predetermined in the horse's foal and yearling stages of development.

That is the bad news. The good news is that it is probably never too late to start horses building healthier, stronger hooves. Unfortunately, most people do not start to worry about hoof quality until there is a crack or a chronic

problem. When the veterinarian stands up in the stall and says, “Well what do you expect? Look at his feet!” a trainer knows that the time has come to address the horse’s foot needs.

Supplementing for health

Adding a hoof supplement to a diet is one of several steps to take to begin a horse on the road to better feet. Choosing which supplement can be a challenge. Evidence is anecdotal as to which supplements will help which horses. Some horses respond to different mixtures, and the actual effect of the supplement is usually impossible to separate from changes in management, topical medications, and alterations in shoeing and trimming.

However, leaving out nutrition from a horse’s hoof-recovery program would be omitting a key part of the equation. Farm managers and trainers would be well-served to make semi-annual evaluations of hoof quality in all horses in their care. A foot management program with the help of a hoof-specialist veterinarian and farrier team will identify which horses are most at risk for hoof problems and help track changes in hoof quality. Is a club foot getting worse? Are those heels farther forward than they were six months ago? Did his coronet always have that bump above the quarter?

Keeping a file or photos of each horse’s feet would be ideal, but it is not always practical when horses are being shipped from farm to track or farm to farm. Notations of nutritional changes in a feeding program should be paired to changes in hoof condition.

Exactly what nutrients are likely to be deficient in horses with oof problems? Scientists do not exactly know the answer to that question. Along the list of minerals, vitamins, and amino acids are needed to keep the hoof functioning at optimal metabolic levels, but moisture and circulation are the driving forces that will affect how individual nutrients are absorbed and utilized.

Many people look at individual nutrients that may be lacking in the diet, but the horse’s relationship to its water bucket is a good place to start any analysis of nutritional needs. Rigidity of hoof wall tissue requires internal moisture in an optimal ratio; external factors can affect the horse’s moisture levels, but the internal water needs of the circulation never change.

Protein is the second key element in hoof health. Protein building blocks called amino acids supply sulfur, which is a key ingredient in the “cement” that fills in between horn tubules.

The B vitamin biotin is by far the most talked-about individual ingredient for stimulating hoof growth. According to hoof nutrition expert Connie K. Swenson Ph.D., biotin is needed for its role in the exocytosis process of hoof wall metabolism. In other words, biotin works to help cement cells together-and keep them together.

According to Swenson, grains, bran and yeast provide the horse with B vitamins, but hay and grass do not contain biotin. However, the horse can synthesize biotin in the hindgut, and this generally is believed to be adequate for most horses.

Scientific studies in the past 20 years have shown that biotin supplementation was helpful to horses in terms of stimulating growth. In general, over-supplementing with an individual nutrient is not advised. Not all horses with hoof problems have a biotin deficiency, and all balanced hoof supplements contain biotin that should be sufficient to meet a horse’s needs.

In recent years, zinc has emerged in a key role in hoof metabolism. Zinc often is deficient in

feeds and forages, and supplementation with a zinc-containing nutrient formula may be helpful to some horses with hoof problems. Measurements of zinc levels in horses in Europe, most of whom were being fed hay and oats, found that these horses had low levels of zinc.

Zinc is a coefficient of more than 200 enzymes needed for healthy cell reproduction and repair and the synthesis of keratin to create hoof horn. However, zinc has a nutritional partnership with copper, and a distinct ratio needs to be maintained between those two nutrients.

The most current nutritional advice includes attention to a horse's supply of fatty acids. The British supplement Formula4Feet was one of the first to extol the value of fatty acid supplementation for hoof health.

A high-quality hoof supplement will contain a correctly balanced selection of hoof-helpful nutrients, including biotin, zinc, and the much-needed amino acids such as methionine.

It is easy to see that feeding multiple supplements to a horse can upset the critical balance of nutrients, particularly the trace minerals. Whenever any feed supplement is added to a nutritional program, whether for a single horse or a group, caretakers must take note of changes in skin, hair coat, appetite, behavior and energy.