A Guide To Proper Care & Nutrition for the Equine Hoof

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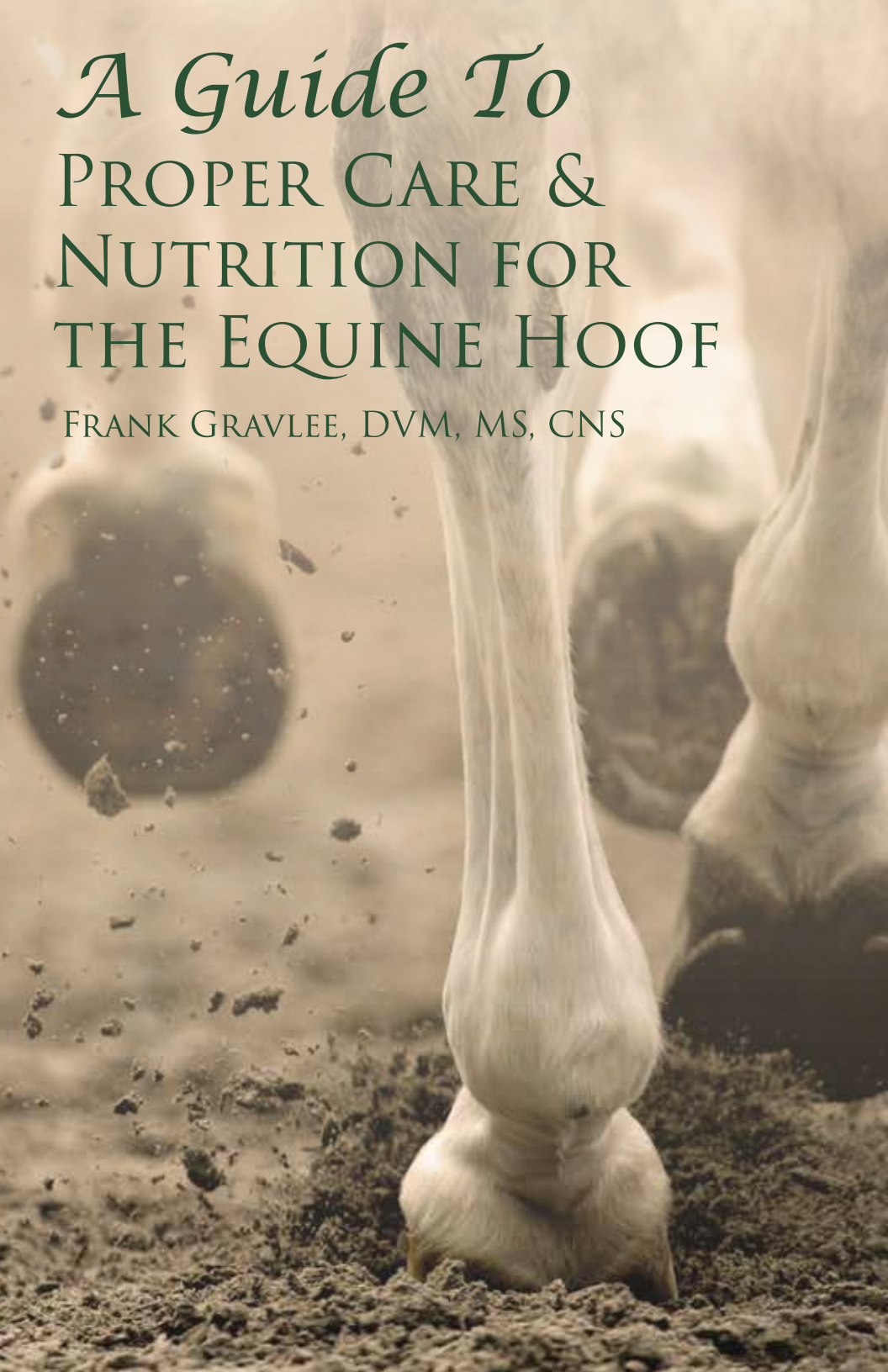


Whether your horse is a beloved backyard companion or an international competitor, healthy hooves are an essential part of his overall health.

The problem is, when it comes to the "correct" way to do things, there are as many opinions as there are horse people. The key is to make informed decisions, with the help of your farrier and veterinarian, about what's best for your horse and you, addressing both internal (nutritional) and external factors.

Although the results of nutritional care are often less noticeable and slower to appear than the results of external care, both are very important to all horses. Here, you'll find many suggestions addressing these two aspects of hoof care.

For overall hoof care, having a good farrier and veterinarian is critical to the success of any horse management program, and you should select these professionals as carefully as you would your own doctor. Then, beyond the regular care they provide, seek their advice as often as needed regarding nutrition, training, and care.

The Anatomy and Physiology of the Hoof

The best place to start is with a basic understanding of how the hoof fits into the anatomy and physiology of the horse. The largest organ (glandular structure) of the horse is the dermal tissue, a voracious consumer of nutrients which includes not only the hooves, but also the skin, hair follicles, sweat glands, oil glands and related structures. Because these parts share common nutrient needs and utilization, it is impossible to nutritionally improve the condition of the hooves without also achieving an improved mane, tail and coat.

What sets hooves apart, and makes them more vulnerable than other dermal structures, is their function. Because they serve as the barrier between your horse and his germ-laden environment, hooves are critical to overall equine health. And, since they show weakness or defect more quickly than the other dermal structures (due to their location and function), hooves also serve as a highly reliable indicator of your horse's dermal health. Of course, paying daily attention to a horse's hooves comes naturally to active horse people, as the consequences of not detecting the early signs of poor hoof health or trauma can be dire.

Illustrations depicting hoof anatomy can be found on page 10.

Genetics Influence all Physical and Chemical Characteristics of the Horse Including the Hooves

Hooves reflect the fact that every horse is an individual, with a home (environment), a family (genetics), and a career (discipline) that affect his body and the level of care needed. You can have two horses in the same barn, on the same diet, competing in the same discipline and level, with the same farrier… and one has healthy hooves, and the other can barely hold shoes on a week at a time. In this case, even though the diet is the same, the culprit is still likely to be nutrition. That's because two otherwise similar horses have many genetic differences… and genetic makeup plays a big role in how nutrients are absorbed and utilized. Begin to vary diet or environment, and the complexity of hoof health and appropriate care becomes apparent.

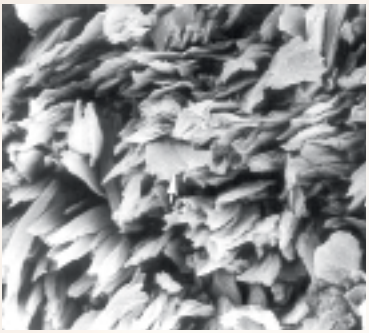
All Horses Require Certain Nutrients as Building Blocks

Nutritional problem-solving can be especially tough, as there are many essential nutrients required for healthy connective tissue. When horses have poor hooves due to dietary factors, it can be hard to determine the exact cause. You can, however, assume he's: 1) not receiving the correct nutrients, 2) not absorbing them sufficiently, or 3) another dietary factor is interfering with nutrient utilization.

If your horse is in the first category, you can start by making sure he is receiving a high quality, well balanced diet that consists of forage, grain if needed to maintain body condition, a hay and pasture nutrient balancer and a hoof supplement that contains all the nutrients known to be deficient in a horse with poor hooves.

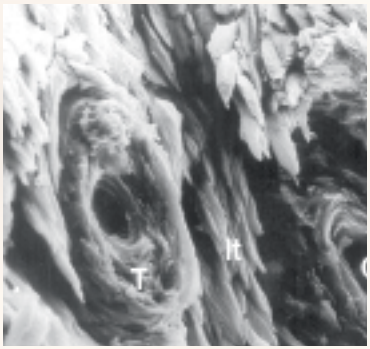
If he's not absorbing nutrients or suffering from dietary interference, the information contained on the following pages may help you solve the mystery.

The electron microscope photos were taken during a study at the University of Edinburgh under the supervision of Dr. S.A. Kempson. The photos illustrate the ultrastructure of the hoof before and after proper nutrition.



At the beginning of the study:

The electronic microscope scan shows the loosely packed keratin squames in the hoof tissue.



The same hoof after six months' feeding with Farrier's Formula®:

The cells are more closely attached to one another, showing well defined "tubule" whirls.

Suggestions for External Hoof Care

• **Hoof trimming** or shoeing should be performed as recommended by your farrier, dependent upon level of work, condition of the hooves, and how fast the horse grows horn. As a general rule, no horse should go untrimed beyond eight weeks. With excessive untrimmed growth, hoof balance alters dramatically, at best decreasing the stride, comfort and performance of the horse, at worst causing permanent structural damage and lameness.

• **Stabled horses** should be kept in clean, dry bedding, with soiled bedding removed a minimum of once per 12 hours of stall keep. Ammonia from equine waste and decaying bedding is extremely destructive to hooves.

• **Wet-dry-wet-dry-wet-dry…** a cycle that's especially tough on hooves, and difficult to control, is Mother Nature changing your horse's pasture from mud to desert to mud again. However, if you're riding in a sand ring, then bathing, then immediately putting your horse in a shaving-bedded stall, you're perpetuating the cracking, chipping and peeling that can accompany rapid moisture changes in the hoof. And if you're bathing with soap, you're stripping the hoof's natural water-proofing oils and waxes. What to do? Keep moisture changes to a minimum, and consider using a topical application that seals in the correct amount of moisture, yet allows oxygen to pass through.

• **Cleaning your horse's hooves should be a daily event**, especially before riding. This can prevent nasty stone bruises and thrush, a bacterial infection that eats away at the horse's frog and sole. Take care to clean the grooves on either side of the frog well, as that's where stones and bacteria tend to collect.

The exception to daily cleaning is if your horse is pastured and barefoot, or tends to pack in only “clean” dirt. There are some good arguments that a “clean” dirt or clay pack actually supports the frog and does the hoof good. Just remember, if you’re not cleaning your horse’s hooves daily, you may not notice when a problem develops until he’s lame.

• **Should you detect a rotting smell** when you clean your horse’s hooves, he probably has thrush. All horses are exposed to thrush; it’s a bacterium that’s always present. Thrush bacteria are opportunistic, multiplying in the absence of oxygen and the presence of waste.

Don’t use copper sulfate, tincture of iodine, iodine crystals or a bleach solution, all are highly damaging common thrush remedies that act as sealants, fostering anaerobic growth of bacteria. Instead, either an organic iodine combined with a non-caustic penetrating agent or a safe antimicrobial clay can be applied into the affected areas of a clean and dry hoof. Of course, chronic or severe cases should always be attended to by your veterinarian or farrier.

• **Hoof remedies…** Remember that, as tough as hoof horn may seem, it’s approximately 95% protein, much the same as your own hair and skin, and therefore as susceptible to damage. A great rule of thumb is to avoid any commercial or home remedy containing solvents, protein-altering ingredients, or anything that seals oxygen away from the hoof. You should also avoid remedies containing axle grease, motor oil, pine tar, formaldehyde, acetone, and turpentine. A non-caustic antimicrobial hoof clay can be utilized to fill and protect hoof defects, old nail holes and white line separations.

Suggestions for Internal (Nutritional) Hoof Care

• Salt and trace-mineralized salt blocks... Salt and trace minerals should not be fed in combined form, as a horse's need for these are quite different. Salt requirements beyond metabolic needs are based almost entirely on the amount a horse sweats, while trace minerals are a metabolic need, and are relatively steady irrespective of exercise and ambient temperature. When salt and trace minerals are fed together in block or loose form, horses are force-fed trace minerals according to their salt needs. This can become dangerous, as trace minerals aren't easily shed, and can rise to toxic levels in the horse's system. What to do? Feed a high-quality hay, a single balanced supplement, and grains as needed as most horses receive more than enough trace minerals. However, it's generally a good idea to provide horses free-choice loose salt to ensure their salt needs are being met. Why not feed block salt? Blocks are intended for rough cattle tongues; horse tongues are too smooth to achieve much gain from licking. Therefore, salt-depleted or salt-addicted horses may bite off a chunk and swallow it, creating an abundance of hoof-destructive urine (excess salt=excess thirst).

• Bran should not be fed in the presence of hoof problems. Whether from wheat, rice, oats or other grains, bran contains phytate, which is high in phosphorous. Phosphorous blocks absorption of calcium in the small intestine, creating a systemic calcium deficiency and undermining hoof health. If bran is being fed to regulate stool consistency, use soaked sugar beet pulp instead. If it's being fed to prevent sand colic (many reports suggest that bran isn't effective for this), psyllium is a better-proven solution.

• **Biotin alone is not enough to correct poor horn quality in most cases**, as it's only one of many nutrients needed by the adult horse. In fact, the adult horse is said to have no dietary requirement for biotin unless under stress conditions such as intense work, traveling, being stabled for long periods or being fed a low-quality diet. And even under these conditions, biotin deficiency is relatively rare, and is usually accompanied by many dietary deficiencies.

• **Horses which respond to biotin supplementation alone** (approximately 5% of those with poor-quality horn) show large holes in the outermost layer of the wall when viewed under a microscope. The inner layers of the wall were usually not affected. However; our recent research indicates that an increased amount of biotin helps the hoof in the presence of laminitis.

• **Methionine, proline, glycine and lysine** are some of the major building blocks of healthy connective tissue, or collagen. Copper and vitamin C are also necessary, serving as catalysts in the formation of strong and healthy horn. All these nutrients should be supplied via diet or supplementation for healthy hooves.

• **Essential fatty acids** are necessary for a healthy, shiny coat, as well as the proper moisture maintenance and pliability of the hoof structure. Your horse can obtain these fatty acids from grain, unprocessed grain oils or the lecithin found in processed grains and supplements.

• **Healthy hooves require zinc** for the prevention of defective keratin, the tough material found in the outer layers of hoof and skin. If keratin is not properly formed, the hoof will be soft and brittle. You can provide the proper quantities of zinc through diet or supplementation.

• **Selenium...** Some believe that selenium will help hooves become healthier. In reality, no known definitive studies support this. In fact, when fed in high amounts, selenium causes excessive and very poor-quality hoof growth, and can be very toxic. Because selenium deficiency can cause muscle problems, supplementation should be handled carefully. Your veterinarian can monitor levels through blood testing.

• **Older horses often have problems chewing…** combine that with their less-efficient metabolization of nutrients, and you have a horse that needs special care. You might try feeding ground hay and/or steam-rolled oats for your near-toothless senior, and continue to provide regular exercise suitable for his health and condition.

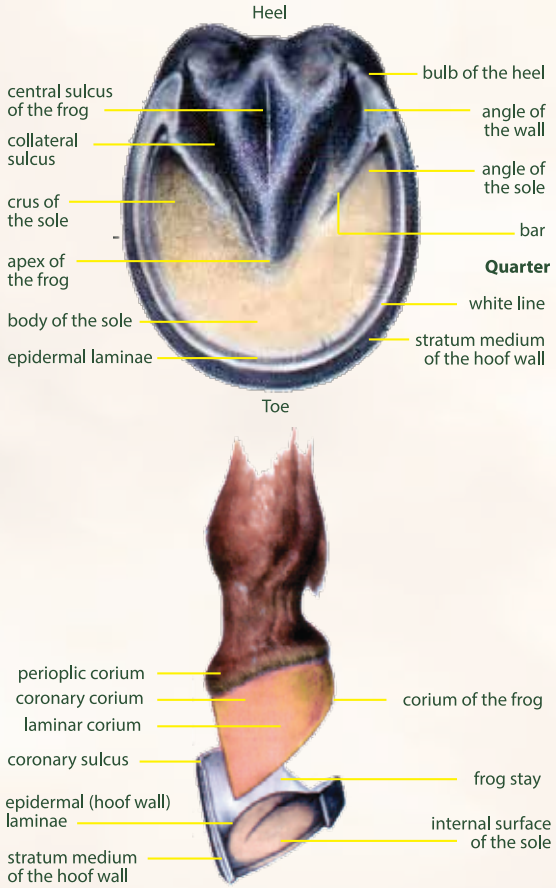
Plus, routine veterinary and farrier care becomes even more critical for aged horses. Older horses often have thyroid problems that can cause poor hoof health and a dull hair coat. If your horse isn't chewing his feed properly, he's not getting enough nutrients. There are many causes of poor mastication, but the most common is uneven wearing of the molars into sharp points. Examine your horse's manure for whole grain or hay stems exceeding 1/4 inch in length, and look for excessive dribbling of feed, or an unusual sensitivity to the bit. These are signs that your horse's teeth aren't doing their job, and require the attention of your veterinarian or equine dentist.

• **Foundered horses** require special care – usually good-quality grass hay, little or no grain (maintain a healthy weight), free-choice water and loose salt, along with a well-balanced supplement for proper nutrition. However, each foundered horse is an individual, and your veterinarian and farrier should be consulted.

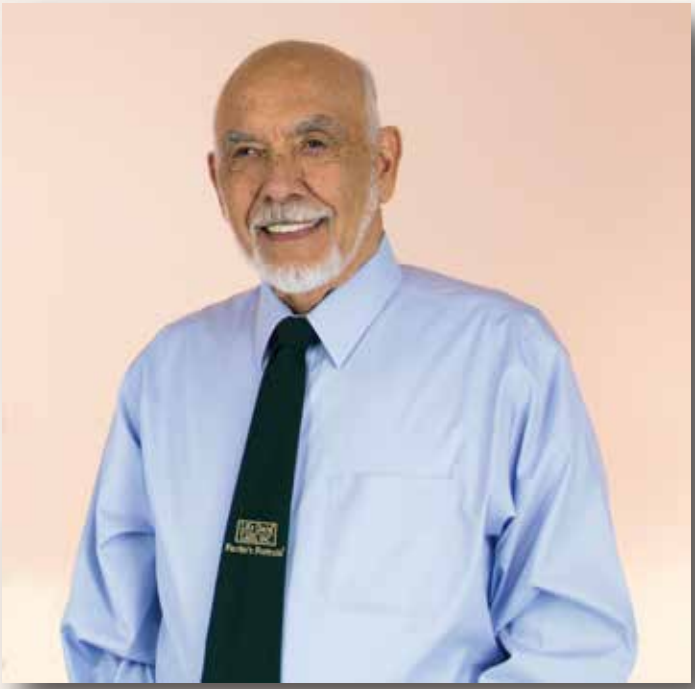
• **"Easy keepers"** (horses that maintain weight on little more than grass and hay) can actually be less than easy, as feeding too much lush pasture or grain can cause founder, while not feeding enough nutrients can cause poor dermal tissue health or thyroid problems. The solution is much like for a foundered horse…good-quality grass hay, little or no grain, free-choice water and loose salt, and a well-balanced supplement that includes L-tyrosine and iodine.

• **Feed only one supplement,** unless the combination of supplements are balanced to feed together and approved by a veterinary nutritionist. Most supplements, when fed in conjunction with others, can cause toxic levels of some nutrients to be ingested.

• **Supplements...** It's good to keep in mind how quickly both good and bad nutritional changes should be seen in the hooves. If your horse does have a noticeable hoof problem, and you begin a nutritional program to solve it, you should see a positive difference emerging from the coronary band within eight to ten weeks. If not, you should re-examine your nutrition and management program immediately with the help of an equine nutritionist.



Here the hoof capsule has been removed and partially cut away to reveal the underlying corium. In healthy hooves, the capsule is tightly attached to the corium by millions of microscopic ligaments. In foundered horses, these ligaments stretch, allowing the capsule to move and press on the coronary band, inhibiting new growth. The healthy corium supplies nutrients to the hooves via blood circulation.



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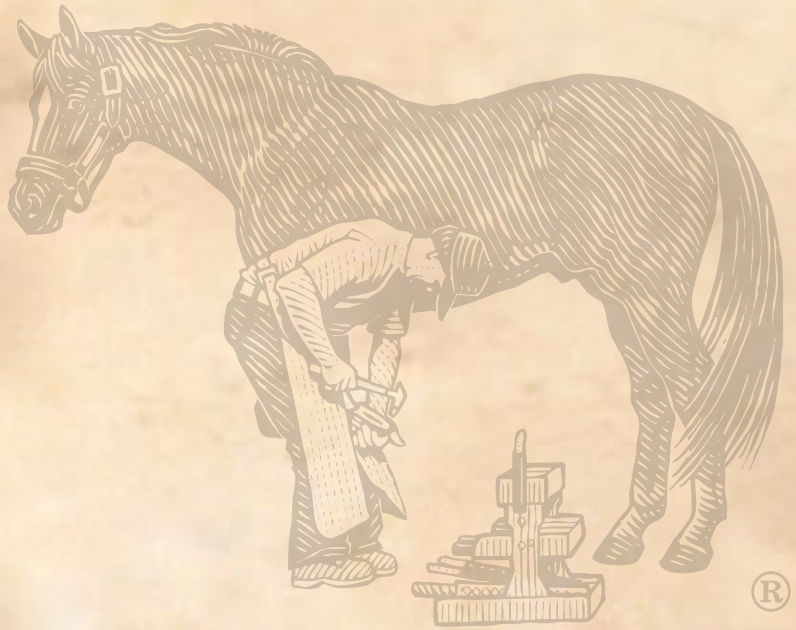
About the Author...

Veterinarian and nutritionist Frank Gravlee, DVM, MS, CNS graduated from Auburn University School of Veterinary Medicine and practiced for several years before attending graduate school at Massachusetts Institute of Technology. During a three-year residency in nutritional pathology, he received a master's degree in nutritional biochemistry and intermediary metabolism, and is a certified nutrition specialist. Dr. Gravlee has written several articles on the relationship between laboratory findings and clinical problems in the field of equine nutrition. He has collected an extensive database of laboratory findings on this subject.

Credits:

1. Leighton-Hardman, 1980. 2. S.A. Kempson, 1987. 3. K. Jack Easley, DVM, 1994.

Medical illustration concept by Ted S. Stashak from the Horseowner's Guide to Lameness. Illustrations by Maureen Shelleay.



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