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How Nutrition Affects the Horses' Hoof

Equine feet will reflect diertary deficiencies and excesses in their outward appearance

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Pictured Above: An imbalance of vitamin A causes flaky, shelly hoof walls and poor tubule structure appearing to be hair growth from the hoof wall. *All Photos: Life Data Labs* From hoof quality to athletic ability, good nutrition influences every aspect of a horse's health. Nutritional imbalances result when a horse is fed too little or too much of a nutrient. Quality forage and grain should provide the bulk of a horse's nutritional needs, but supplements also may be needed to balance a horse's ration.

Many horse owners specifically choose to feed supplements with the goal of improving the

Farrier Takeaways

A balanced diet for the horse consists of an assortment of nutrients, including protein, vitamins, minerals and amino acids. These nutrients may be supplied through forage, grain and supplements.

Nutrients must be balanced according to a horse's age, sex, body condition score and occupation. Over- and under-supplementing nutrients can negatively affect a horse's hoof growth and quality, but also the overall health of the horse. Life Data Labs offers free blood testing to horse owners as part of its research to study the relationship between nutrition and horse health.

quality of a horse's hooves but they might not always know the appropriate quantity of a supplement to feed. Over-supplementation and under-supplementation of nutrients can negatively affect a horse's hoof growth and quality, as well as the overall health of the horse. Throughout the course of regularly scheduled trimming visits, a farrier might notice some of the symptoms indicative of a nutritional imbalance. These can include:

Poor, unthrifty hair coat that appears dull with hair that breaks easily, grows slowly or sheds frequently.

Loss of muscle, especially along the topline, which may affect conformation and performance. Low energy levels.

Slow-growing hooves that split, crack or flake.

"When we talk about poor nutrition for the hoof, we're going to be limited to some very slow to no growth," says Mike Barker, sales representative for Cherokee, Ala.-based Life Data Labs, a producer of equine supplements.

Barker shared his presentation, "Over and Under Supplementation: The Effect on Hoof Quality" during a How-To Hoof-Care Product Knowledge Clinic, sponsored by Life Data Labs, at the 2020 International Hoof-Care Summit in Cincinnati, Ohio.

"We often end up with thin hoof walls that want to split or crack," he says. "When you have a situation like that, you're going to have difficulty maintaining and holding a shoe between resets."

Hooves affected by poor nutrition are also prone to secondary issues, such as thrush, white line disease, abscesses and microbial infections.

Setting Nutritional Goals

A balanced equine diet is made up of protein, vitamins, minerals and amino acids.

It is prudent to consult an equine nutritionist and set nutritional goals for a horse before embarking upon a feeding program, Barker says.

"We have to balance each and every one of those nutrients in order to achieve the balanced diet each horse needs so that we don't end up with an excess or deficiency in a specific nutrient that the horse needs for daily function," Barker explains.

Formulating a balanced diet depends on a number of factors. Daily nutrient requirements for a given horse change based on:

> Age. Sex. Body weight and condition. Occupation and level of work.

For example, a breeding stallion also being used for high level competitions will require a different ration than the easy keeper backyard pony prone to laminitis. While it might be tempting to add calories to the high-performing

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Watch Mike Barker's International Hoof-Care Summit presentation "Over and Under Supplementation: The Effect on Hoof Quality" at

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stallion and reduce calories for the easy keeper, maintaining a balanced ration for the horse is not that simple.



Selenium toxicity causes defects in the hoof wall, including horizontal wall ridges or cracks, a crusty coronary band and other issues. Selenium toxicity also causes the hoof wall to become vulnerable to invasion by bacteria or fungi.

Avoiding Nutrient Imbalances

If an owner is feeding sweet feed and realizes the horse is overweight, a decision might be made to cut back on the feed. But there's a problem: cutting back on the amount of feed to save calories also means cutting back on nutrients.

"If you look at a bag of feed, the bag is going to tell you that you have to feed so many pounds per day to that horse in order for the horse to receive the nutrition it needs," Barker says. "If it's 8 pounds, and we cut that in half to 4 pounds, we end up cutting calories in half, but we also cut the nutrients the horse needs in half, as well."

Cutting back on a horse's feed without supplementing for essential nutrients can result in a deficiency, but an excess of a nutrient can be just as damaging.

"Vitamin A has a direct influence on the foot of the horse, and it's prevalent in just about everything as far as feedstuffs for horses," Barker says. "If we're supplementing, in any form, vitamin A is going to be included. If that horse is grazing, vitamin A is also available in the forage and in the hay that we may be providing. It's difficult to cause a deficiency in vitamin A. In most cases, it will be an excess."

If a farrier encounters a hoof wall that has become shelly and flaky, or has hair-like projections growing from the hoof wall, the horse may be experiencing a vitamin A imbalance.

Selenium, a key trace mineral in a horse's diet, also can cause major issues for the horse if it is given in excess of 2 to 3 milligrams per day. This can be easy to do if a horse in a selenium deficient area is given a selenium supplement and the mineral is also added to the feed. Then, if forage is brought in from an area that isn't selenium deficient, that horse will end up with three sources of selenium and be as risk of toxicity.

Signs of selenium toxicity that a farrier might notice include:

Lameness. Hoof defects and poor hoof wall structure. Horizontal hoof wall ridges. Cracks. Crusty coronet band. Hoof wall invaded by bacteria or fungi.

Another important trace mineral is calcium. Calcium is essential for the firm attachment of one horn cell to another within the hoof, which affects the general cohesion and integrity of the hoof horn.

"Calcium is simply the glue that holds the hoof together," Barker says. "If we lose the glue because the calcium isn't available, then the hoof is going to fall apart."

Calcium deficiencies can result if the horse's calcium-to-phosphorus ratio is out of balance. In a typical 1,000-pound horse, the calcium-to-phosphorus ratio might be 1:1. Young horses, growing horses, broodmares and foals require more calcium, and in those cases, the ratio may be as high as 2:1.

"If a horse is being fed bran on a daily basis, for example, bran is extremely high in phytates, which are high in phosphorus," Barker explains. "That can get the calcium-to-phosphorus ratio out of balance. The excess phosphorus ties up the calcium the horse needs, and we end up with a calcium deficiency."



A calcium deficiency robs the hoof wall of its integrity and cohesion, which can lead to collapsed heels and crumbling horn around nail holes.

Continuing Research

For the past 40 years, Life Data Labs has researched the relationship between nutrition and disease in the horse. Life Data Labs' strong research program began with the work of founder Dr. Frank Gravlee, who developed the technology behind flagship product Farrier's Formula.

"Life Data has put much effort in trying to determine the nutritional needs of the horse," Barker says. "Through blood work, Dr. Gravlee was able to determine what nutrient deficiencies and excesses were common and he put together the formulation of Farrier's Formula." "The sole purpose of Farrier's Formula is to improve all dermal tissue in the horse," Barker says. "Skin, hair, tendons, ligaments and the foot of the horse are all made of dermal tissue. A good hoof supplement will improve all aspects of that, along with the foot itself."

Life Data Labs continues to conduct equine nutrition research through an extensive study that analyzes blood samples from horses. The in-house laboratory measures trace mineral content in blood from horses of different ages, breeds, and body condition scores in order to correlate the results between nutrition and health conditions.

"We've developed a computer program that can do the math to determine relationships and the proportion and ratio of different minerals to each other," Barker says. "Blood testing is the most efficient way to determine the deficiencies or the excesses that are in the diet of the horse."

The tests consist of a complete blood count, chemistry, thyroid and a trace mineral analysis. Coupled with a history of the individual horse, the tests help researchers to identify common nutritional imbalances and examine their relationships with diseases.

The blood test is free. To learn more, or participate in the blood sample research study, visit LifeDataLabs.com or call (800) 624-1873.

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