COAT FADING

Understanding Causes and Tips for Prevention

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With the
Education Committee

One of the things Friesians are most admired for is their striking black coat, and when it comes to Friesians - the blacker the better. In fact, the KFPS states in the official description of breed characteristics that "jet black is preferred" when it comes to Friesian coats. This attribute is even evaluated and scored on the linear score sheet of all adult Friesians. Some Friesians stay jet-black year round whereas others experience sun fading, much to the dismay of their owners. So why is it that some Friesians' coats fade and others do not? The answer is likely due to three primary factors: nutrition, environment, and genetics. While there is little an owner can due to influence their horse's genetics, much can be done to ensure a horse's diet is optimal for a darker coat and there are several environmental effects that may contribute to coat fading that can be minimized.

LET'S TALK HAIR

To explore the factors associated with coat fading, it is important to understand a little more about your horse's hair. Each individual hair has three distinct layers to it.

The outer layer is called the cuticle. It is composed of colorless cells, called scales, which are arranged in an overlaying fashion that looks similar to shingles on the roof of a house. Think of the cuticle as the armor for the hair. Its job is to be the first line of defense for the inner layers of the hair.

Although hair itself is lifeless, it's moisturized by skin oils. The sebaceous gland, connected to the hair follicle, secretes skin oils. These skin oils, comprised of fatty acids, coat the outer layer of the cuticle, tightly seal it, and repel water.

Smooth Healthy Hair

Dry Damaged Hair

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The next layer is called the cortex. This layer is composed of elongated cells, which are tightly packed into bundles of fibers. The cortex contains pigment called melanin (also found in the skin), which gives the hair its color. The principal purpose of melanin is to protect the hair from damaging ultraviolet (UV) radiation, or sun damage. There are two basic types of melanin found in a horse's skin and hair: pheomelanin and eumelanin. Pheomelanin, which appears yellow or reddish brown, is found predominately in the hair of chestnuts and lighter colored horses. Eumelanin appears brown or black and is found in bay, brown, and black horses.

The final and most inner layer of the hair is called the medulla. This is a hollow area, which houses the blood vessels that feed the hair's root.

If either the cuticle or the outer layer of fatty acids are compromised, due to a nutritional deficiency or environmental factors, the melanin in the cortex can be exposed to ultraviolet radiation. Damaging ultraviolet radiation then begins to breakdown the melanin in the hair. This changes the way light reflects off black hair and makes the hair appear lighter or reddish brown. This type of damage is commonly referred to as sun fading or sun bleaching. Once the UV radiation has occurred and the melanin has been damaged it cannot be reversed. New, undamaged hair must grow in to replace it.

NUTRITION- FEEDING THE HAIR

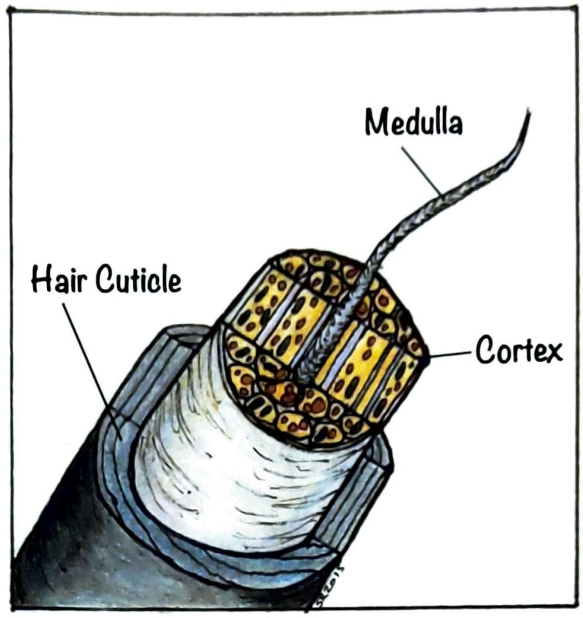
Some Friesian owners spend a fair amount of time avoiding sun exposure all together for their horses but a few simple nutrition changes may make a major difference in the coat's ability to protect against UV radiation- especially for those horses that seem to fade even when they are protected from sun exposure.

There are two common mineral deficiencies in horses that affect melanin production- copper and zinc. According to the National Research Council (NRC), a 1,100 pound horse at maintenance requires 100 mg of copper and 400 mg of zinc per day.

Copper is a critical element in the manufacturing of both pheomelanin (lighter melanin) eumelanin (darker melanin). Zinc, however is required for the production of the darkest shades of eumelanin. Thus, a copper deficiency can cause color changes in any coat color, while a zinc deficiency is most obvious in black horses- bingo!

To further complicate the effects of a copper or zinc deficiency high levels of magnesium or iron compete in the horse's body for absorption. So, if a horse's diet is adjusted to provide the ideal amount of copper and zinc but no consideration to the amounts of magnesium or iron is given, the effort may be in vain and the resulting changes in coat color may be less than desired.

Hair Shaft Cross Section



Hair, Hair Follicle and Sebaceous Gland

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Iron, in particular, deserves additional consideration as most of North American soil content is high in iron. This means most horses in North America ingest the minimum daily requirement of iron through forage and water alone. According to the NRC, an 1,100 pound horse at maintenance requires no more than 400 mg of iron per day. Owners should be cognizant of any additional iron sources they are adding through grains or supplements, which may contribute to excess iron, thus affecting the horse's ability to absorb the required amounts of copper and zinc.

So what is a horse owner to do? First off, know your forage! Some owners spend immense amounts of money on the best feeds and supplements for their horses without ever giving thought to how it compliments their forage. Many owners might be pleasantly surprised to discover their forage is meeting nearly all their horses' mineral needs minus a few minerals, while other owners may be unaware they need to provide more extensive mineral supplementation.

But how do you know what mineral levels are in your forage? Simple - have your pasture and hay analyzed. For much less

than a month's supply of many commercial supplements you can send off a sample of your pasture and hay to be analyzed and then you will know exactly what minerals your horses' diet is lacking. To really get to the bottom of things, having your forage analyzed may be an important step. There are a number of commercial services available that provide forage testing.

Next, read the labels and develop a complete picture. Many owners opt to feed commercial feeds for simplicity or for additional calories. Be sure to read the ingredients list and the nutritional labels on your feed products. If you are feeding a commercial feed you are likely adding additional iron to your horses' diet. Not all commercial feed products list iron on their labels so you may have to do a little additional leg-work to determine how much iron you are feeding your horse. If you are feeding an additional supplement with your grains, you'll have to add that information to the equation as well. You may in fact discover you are overfeeding some minerals.

The process of determining what minerals you are feeding your horse between your forage, grains and supplements can be rather complicated for some owners. If this process seems overwhelming, you might consider consulting with an equine nutritionist who can guide you through the process of testing and analyzing your horse's diet. You might discover you can save a good deal of money by cutting out unneeded products from your horses' diet.

Don't forget the fat! Remember those fatty acids on the outer layer of the hair cuticle that seal the hair shaft and repel water? Adding fat to your horse's diet can help provide that additional coating of protection and has the added bonus of producing a lovely shine. There are many popular options for adding a little fat to the diet safely, even for those easy keepers. The best fats are those that contain a balance of omega three and omega six fatty acids.

Many oils are easily top dressed over commercial grains or grass/alfalfa pellets including vegetable, soy, or corn oil. Black oil sunflower seeds, or BOSS, are also easily top dressed and are highly palatable to most horses. Rice bran and soybean meal are also effective sources of fat. Additionally, there are many commercial fat products on the market or products that promise a shiny coat. As always, read the labels and be sure to consult with your veterinarian before making changes to your horse's diet if needed, particularly if the horse has an existing health condition.

ENVIRONMENT- PROTECTING THE HAIR

Nutrition is only half the battle. Most horses will benefit greatly from a few simple steps their owners can take to ensure the hair isn't damaged by environmental effects.

First, keep the coat clean. Sweat is a large factor in many horses that are sun bleached. Sweat leaves behind a salty film that can quickly dry out the protective cuticle of the hair and expose the melanin to the sun's damaging ultraviolet radiation. Rinse off sweat after exercising your horse or at the end of those hot summer days. Dirt and mud can also wear away the hair's natural protection. Remove any dirt that is caked on to the coat. A brisk daily currying of the coat using some good muscle goes a long way to bringing up the natural oils in the skin to the coat's surface.

Lay off harsh shampoos. Every time you bath your horse, you run the risk of compromising the protective cuticle or removing the layer of fatty acids on the cuticle that seal the hair shaft. If you must shampoo your horse, avoid harsh alkaline shampoos and inexpensive products like dishwashing soap. There are many products on the market that are cost effective and specifically made for horses. Don't forget to condition the coat after shampooing as this may help protect and seal the cuticle if it is compromised during shampooing.

Limit UV exposure. Many Friesian owners prefer to limit day time exposure to the sun during the long summer months, turning out only at night, in order to reduce coat fading. There are certain advantages to this course of action but be aware that sweat is still rinsed from the coat.

Consider adding UV protection. There are topical products that may provide surface protection from ultraviolet radiation. Some of these products are combined with fly sprays that are a convenient choice for many owners, and others are stand-alone sunscreens made specifically for horses. Be aware that these products may provide some protection, but will likely not be able to penetrate and protect the entire coat. They will also need to be reapplied on a regular basis, especially after bathing. A popular option for many horse owners who prefer their horse to receive more turnout time is a flysheet that provides added UV protection. Several manufacturers of flysheets offer these options. These sheets may be hot, and in some cases may increase sweating so be sure to rinse off any sweat at the end of the day.

GENETICS

Despite the most optimal nutrition and environment, some Friesians, unfortunately, never achieve that highly desired jet-black color. Others, with little or no help seem to stay a deep shade of black year round. Why is this? While much research is available about equine color genetics, we don't yet know the genetic factors specifically responsible for determining shades of black. However, most researchers agree there is a possibility that a genetic factor exists that contributes to a jet-black coat, commonly referred to as a "true black".

CONCLUSION

Spring will be here before we know it, unveiling those new, gorgeous, black Friesian coats. With a little work now, you can put in place the optimal nutritional elements and protection to help that lovely dark coat stick around well past spring. If you find your Friesian cannot attain that jet-black coat despite your best efforts, don't despair. After all… he is still a Friesian.

* For more information on nutrient requirements, you can look up the National Research Council's recommendations for your horse according to age, weight and activity level by going to their website at http://nrc88.nas.edu/nrh/

...Angie ...Donna Kelley.

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