

TRANSITIONING FROM FEED TO Grass

It's a known fact: horses will walk past a carrot to get to spring grass. They will contort their bodies into pretzel-like shapes just to reach under a fence for a minor number of grass blades. Grass must be as delicious to them as ice cream to us and seemingly a natural feature of their diet.

If only horse care were so simple that you could feed what they love all the time. You could turn them out in a field with lush spring grass up to their knees and let them chow down for hours on end. If only the wrong ideas about grass were not potentially life threatening.

How could such beautiful, tempting spring grass be a bad thing? Certainly horses in the wild lived on that kind of forage.

Horses in the wild were constantly on grass with nature transitioning them from winter to spring feed, slowly, giving their digestive systems time to adapt to the grass that grew rich with high quantities of sugar and starch.

The horse who spent the winter in a stall or dry paddock can't one day eat hay with less sugar and starch and the next day gorge on a load of rich grass without overwhelming his digestive system in a potentially life threatening way.

Most pastures in the United States today were developed to cause rapid weight gain in growing cattle. So while it is difficult to make sweeping generalizations about the wide variety of grasses and the climates in which they grow, they all produce in spring great quantities of easily fermentable carbohydrates which are of benefit to those raising cattle but potentially a source of laminitis, colic and obesity for horses not transitioned to grass wisely.

To evaluate the best way to transition a horse to grass, take a look at the needs of the horse's digestive system and how grass growth fits into those needs.

No matter what the change is in a horse's diet, it must be gradual enough to allow the bacterial population to adapt. "Like with rabbits and coyotes, if you don't have coyotes, you have lots of rabbits and then the coyote population takes off as there is abundant food, and then you have lots of coyotes and few rabbits," says Dr. Clair Thunes of Summit-Nutrition in Northern California.

"Like any ecosystem, the hindgut bacteria live in delicate

balance. Changes in feed disrupt the bacterial population causing one type of bacteria to decrease while others increase. In extreme cases, those that increase are pathogenic bacteria not beneficial to the horse.

"All changes in diet should be made over one to two weeks to give the digestive track time to change its enzymes to match the kinds of nutrients being digested and to give the bacteria time to adapt to the new environment," says Thunes.

Putting horses on pasture is a diet change. Young grass growth is especially different from hay, having low fiber, high sugar and protein. "When we look at the digestive system and the effects of diet, we're trying to avoid too much easily fermentable carbohydrates or nonstructural carbohydrates (NSC), sugars and starches," Thunes says.

As the young grass grows it uses the NSCs for its own development. At different growth periods, the NSCs move to the parts that the plant is trying to develop. If the NSCs are in the roots, it's not a problem for the horse. When the plant is trying to grow, it mobilizes those stores from the roots to grow stems and leaves. Later the leaves become a store of more NSCs and are accessible to the horse. This may be fine, providing the horse has adapted to that amount of NSCs, does not have other physical problems and the quantity in the grass is not overwhelming. This will depend on the type of grass, temperature and climate.

Cool season and warm season grasses react differently to environmental stress.

For example, cool season grasses, such as orchard grass, are more sensitive to cold and warm temperatures. Warm season grasses, like Bermuda grass, are essentially dormant in cold weather. The temperature and climate affect the amount of the carbohydrate production differently in the two grasses.

Warm season grasses are high in starch while cool season grasses are particularly high in fructans, sugars that can't be broken down by the normal action of enzymes in the stomach and small intestine. These sugars pass onto the hind gut where they are rapidly fermented by bacteria-producing lactic acid which may cause colic and laminitis if the digestive system has not adapted to the change in feed by producing

bacteria that adequately utilizes lactic acid. (Laminitis is an inflammation of the tissues that connect the coffin bone to the hoof wall inside the foot.)

Stress can cause the heavy production of NSCs, and if the plant is struggling to grow in the wrong climate, it will produce more NSCs. "It's important that the grass is suitable for your climate," says Thunes.

In heavily grazed pastures, horses will consume the lower two inches of the pasture plant where fructans are stored. "Owners say they're not going to irrigate or fertilize because those things make really lush grass when actually short grass that is over-grazed, under-fertilized and under-irrigated has as high, if not higher, quantity of NSCs than if it was properly managed."

Plants reacting to drought or frost show a rise in fructan levels by as much as 30 percent. Even when a variety of grass is available, horses will likely choose the plants with the highest levels of fructans.

"In species of grass that store fructan, it will begin to accumulate again in older growths of grass as they are stressed by drought or low temperatures. This can upset the organisms in the hind gut, causing bloating or colic. Pasture related laminitis usually occurs in horses that are insulin resistant," says Dr. Eleanor Kellon, VMD and co-owner of the Equine Cushing's and Insulin Resistance Group. "High sugar and/or starch levels may cause an insulin rise. Insulin resistance is a condition where cells do not respond to insulin, the hormone primarily responsible for transporting glucose into the cells."

In addition, a horse may become too fat on rich



Highland Photography by Darci

grass. While in the spring the amount of sugar per mouthful goes down because the plant is using its stores of starch and sugar for rapid growth, there's likely so much grass that the horse may easily overindulge.

Given the serious potential problems with grass, sensible horse care is marked by caution and study. Find out what kind of grass you have and how it reacts to your climate.

Be aware of the environmental factors that influence the carbohydrate content of your type of grass in your pasture. As an example, Florida pastures offer different grass than northern California, and a drought-inflicted pasture may be stressed enough to cause a problem. Consult a plant specialist at your university extension service.

Be aware of how your horse's digestive system works and start slowly with 15 to 30 minutes a day on the grass, increasing by a similar amount every day.

Be consistent and systematic. "You want to avoid the yo-yo feeding," says Thunes. "For instance, some people feed grain a couple of times a week when they ride, and the rest of the week the horse gets nothing. Such random changes in diet can disrupt the digestive process and the same is true for grass. So even if you can only get him out to hand graze some days, in my mind that's better than skipping a day on grass, and then having him out on grass for four hours for a couple of days."

To prevent gorging, give him plenty of hay before going out on the grass. If the horse can't be gradually conditioned to grass and must be out, put on a grazing muzzle. Neither horse nor humans are fans of these, but the alternative is much worse.

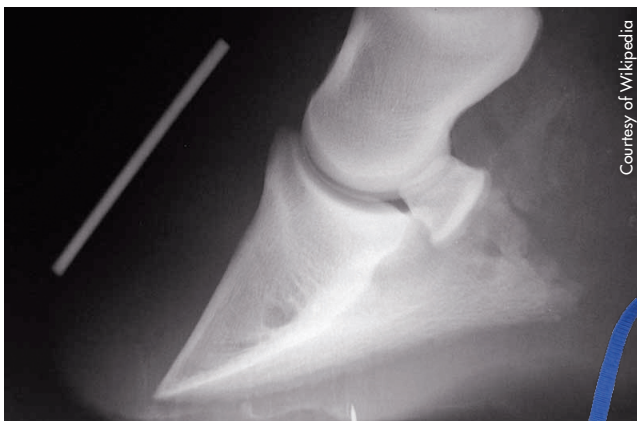
The safest time of year is not simply calculated. "We all have learned about spring grass because we can see the grass growing. But the danger is the grass that doesn't seem to be doing anything. There can be a lot of starch and sugar in summer and winter pastures as well as spring and fall. Weeds can have very high levels of sugar and starch," says Thunes.

The best time of day for grazing may be a cloudy morning after a warm night. In warm weather the sun causes photosynthesis causing the plant to create and store fructans for use in its growth overnight. For that reason, grazing would be better in the morning.

However, if the evening temperatures are below 40 degrees, the plant metabolism shuts down and the sugars stay at high levels in the leaves. In the morning the high level of starch and sugar is still there. If the horse is sensitive, maybe that's the day he doesn't go out and time on the grass should be limited for all horses.

If weather is sunny in the day and warm at night, grazing in the early morning when the plants have used up their NSCs from the day before is a good plan.

Be mindful of his condition. "Weigh" the horse weekly using a weight tape. Diarrhea or bloating is a sign that the



Courtesy of Wikipedia

ABOVE: X-ray of a hoof with laminitis which can result when a horse ingests too much cool season grass high in fructans, sugars that can't be broken down by the normal action of enzymes in the stomach and small intestine.

RIGHT: If the horse can't be gradually conditioned to grass and must be out, put on a grazing muzzle.



horse is getting too much grass and is not adapting. Laminitis can strike without warning, but you may see a fatty crest on the neck or other fatty deposits to give you some warning.

Once transitioned, some horses can live completely on grass if it meets their energy and protein requirements, though likely they will need a mineral supplement. If a horse needs more weight, a ration balancing type feed or grain can be supplemented. "If you have a performance horse that is on pasture and seems to have enough energy, it may be that he is gorged with grass," says Kellon.

And some horses should not go on pasture at all. Those with a history of laminitis or insulin resistance are among them. "Grass levels of sugars and starch fluctuate widely, so you never can be 100 percent sure it's safe. That said, if the horse is in regular, daily work, you can allow a short period of grazing immediately after exercise. Very mature stands of grass that have dropped their seeds are safer as long as they haven't been stressed," says Kellon.

"We have all grown up to believe horses should be on pasture," says Thunes. "Owners that have bought land, taken their horses out of the boarding stable and are excited to get them out, are mortified when a few months later their horses have foundered. For some horses the reality is that they can never go out on a grass pasture."

Yet for most horses pasture is a pleasure, given the right steps to get them there. 🌱

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