HORSE BASICS

FORAGE & HAY

Horses evolved on the northern steppes: vast grassy plains of virgin soils and sparse moisture. In contrast, modern pasture management and hay fields encourage single grasses or leguminous mixes grown in a forced manner by irrigation and fertilization on minerally depleted soils.

ALFALFA

The relatively recent usage of feeding straight alfalfa or high clover content hay to horses evolved from the cattle industry where fast weight gain was desirable and where the animals were not only "pasture potatoes" but where they also did not live long enough to develop the problems we see now in our modern mounts. Karen E. Hayes, DVM, says that *"If your horse's ration consists of 100% alfalfa, he may look healthy, but that does not mean it isn't taxing his system."* In fact, there is a host of modern disease states ranging from a general "bad attitude," nervousness, "cinchiness," scratches and thumps up to tying-up, OCD, DOD, thyroid dysfunction, kidney disease, regular colic/impaction, enteroliths, arthritis/joint disease, and much more which trace directly back to the feeding of straight alfalfa to equines. Most of these conditions can be reversed by simply switching over to good, natural grass forage.

Horses require a *calcium:phosphorus* ratio of 1 or 2:1. In contrast, most alfalfa averages 8:1. High calcium can suppress magnesium levels causing muscle tie-up especially in fillies and mares whose high estrogen levels during heat cycles limit magnesium efficiency. This imbalance also can cause bone and tooth malformation and increased tendency to fractures.

Mature working horses only require a protein level of 12% and alfalfa averages 18% with much of it even higher. A University of Maryland study showed that excess protein levels actually slowed performance down and Colorado State University studies have shown excess protein inhibits T4 production causing glucose imbalance which in turn can lead to excess lactic acid in muscles.

When individuals claim the only way they can keep weight on their horse is with alfalfa, in truth they are seeing edema, or water weight, as "fat" which is why it is lost so fast once alfalfa is removed. The high protein content causes an acidosis in the equine system which the horse buffers by pulling calcium from tissues and bones. This in turn causes an electrolyte imbalance within the cells allowing cellular edema to form.

Horses on high alfalfa will urinate more and their urine will have a very pungent ammonia odor; in fact we have had many individuals inform us that they chose to switch from alfalfa to grass just to get rid of the smell! Of course dealing with that ammonia means that the kidneys are overworked resulting in possible future kidney damage. In addition, intestinal stones are formed from ammonium magnesium phosphate.

Large, and sometimes small, amounts of alfalfa can also cause founder or laminitis. No horse who has *ever* foundered should have any at all. Likewise if a horse eats too much of it, the fineness of the stems/leaves can cause intestinal impaction. In fact, allowing a horse free access to alfalfa hay or an alfalfa field can kill it just as surely as a bullet in the head. Horses evolved on grass and need good grass to survive. However, some horses can do well on no more than 10% forage in alfalfa.

GRASS

Always feed the best, most natural grass you can find that is unfertilized and even unirrigated since such water can be contaminated with industrial toxins such as fertilizers. *Nitrosis* or nitrogen poisoning is becoming quite hazardous to equine health with the most visible side-effect being mid-term abortions in broodmares; we lost three babies to this one year from irrigation water to natural grass hay. While most people, including too many hay growers, are unaware of the dangers of *nitrosis*, more important even than having your hay tested for nutrients is having the nitrogen level tested. Check with your local extension office.

Hay should smell good when you open a bale and be somewhat resilient to the touch. Hay baled too wet can mold while hay allowed to cure too long, will be brittle, dusty, and have little nutrient value. Bright green hay, or multiple cuttings, *can* indicate fertilizer dependency but not always; ask the grower.

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In wet areas, especially when trying for multiple cuttings, many growers "salt", or inoculate, the hay with either sodium carbonate or a mix of sodium carbonate with potassium carbonate in order to dry it faster. This will break down the protective waxy substance that plants naturally have to keep themselves from dehydrating thus causing inoculated hay to feel more dry and crackly, with "rough" rather than smooth stems. Unfortunately, the excess sodium and potassium can unbalance both electrolytes and inhibit calcium and magnesium utilization in those eating such hay.

Examine all forage (hays, pastures, turnouts) for noxious weeds; check with your state university extension offices to find out what may be in your area. Drought conditions can turn normally benign plants poisonous and fast spring growth (warm days/ cool nights) of grass can cause high *fructan* levels which can lead to grass founder in sensitive horses.

QUANTITIES & PURCHASING

Unfortunately, too many people think they need to limit grass hay quantities like they do alfalfa and speak of 1 or 2 flakes of grass hay. In reality, most horses except the most obese (who have other health problems) require virtually free choice access to grass hay. In his book, Beyond the Hay Days, Rex Ewing says: *"By nature, horses are grazers…the horse's digestive system is designed to move a continuous stream of moist, fibrous material, and it is very important for us, as their keepers, to approximate those natural conditions as closely as possible . . ."* Researcher Joe Pagan, PhD says a 1,000# mature, maintenance horse requires 25±# of good grass hay per day with hard working (including broodmares), debilitated, or high metabolism horses requiring commensurately more. It should be fed at ground level *only* (old tanks, rubber mats, etc.) or risk cervical problems from stiff necks to thryoid inhibition.

When calculating hay needs, we generally figure 4 tons per horse per year. That is in northern Colorado and we have relatively little graze; just enough for good enzyme values although hay consumption does lessen in high summer. Since grass hay generates far more heat than either alfalfa or grain, our winter use is higher than in more tropical climes. Generally the most cost-effective way of purchasing hay is by the semi-load (approximately 20T±; enough for 5 horses for 1 year here) with the most expensive way being by the bale at a feed store. By not being able to talk directly with the grower, you also may not be able to learn all you would like to concerning the growing, fertilizing, baling and spraying procedures.

Most hay today is priced by the bale. Bale weights can range from 35#± to 85#± so it wise to price your hay by the pound rather than the very ephemeral "bale." $6 per bale may sound far better than $9 per bale until you discover that the $6 hay is only a 35# bale which comes to 17 cents per pound while the $9 per bale hay weighs 75# bale which comes to 12 cents per pound. At approximately 25# per day for hay feeding most horses, that works out to $4.25/day for the 35# bale yet only $3/day for the 75# bale resulting in an annual savings of $456.25. Of course this is not taking quality, previously discussed, into consideration.

When hay is being shipped in, it is wise to be there to check the bales as they are offloaded. We always break open random bales to check the interior; if it is not up to our standards and to the standards that were represented either verbally or visually, the load is refused. Yes, we have done that and you can, too.

GRASS HAY VARIETIES

So which grass hay is the "best?" It really depends on what is available in different parts of the country.

Our personal ideal hay is mountain or plains-grown mixed grasses. Such a mixture will provide a wider variation of nutrients than mono-culture. However, these natural/native grasses are not easy to come by if you live outside such areas and even within them. Since the grasses provide only one cutting, at least if they are unfertilized and un-irrigated, they are self-limiting in quantities available. There are other options, but the ultimate "goodness" of *any* hay is dependent upon health of the soil, fertilization procedures (**HumiZyme** soil is the best possible), maturity at cutting, baling techniques, etc. Good hay should smell sweet, contain little to no dust let alone mold, and be free from herbicides and pesticides.

Generally speaking, first cutting orchard-grass, bluegrass, timothy, bermuda, brome, or mixes of any of those, are considered good hays for horses. First cutting is preferable to second since it is slower growing thus containing more of the necessary fiber.

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Remember to feed by the accurate pound, rather than the ephemeral "flake." And be aware that drought years can turn normally fine fields into toxic ones as various plants try to save themselves from extinction. Here are some possibilities.

Alfalfa mix We tend to discourage an alfalfa mix, even if it is only 10% or less, because essentially it defeats the purpose of being able to feed the hay fully free choice. Usually the mix is not standard throughout the field (as a matter of fact, alfalfa tends to take over) and one bale may have very little alfalfa while the next bale may have an extremely high percentage. If you wish to feed some alfalfa hay to balance protein, we think it far safer to get plain alfalfa bales and feed a small flake, 1-3#, at lunch. Or, for even more control, get good alfalfa pellets, as we do, that dissolve easily (for choke control, always soak your hay pellets thoroughly) and simply give a quart (app. 1.5#) or two per day as a concentrate depending on protein content of your grass hay and the needs of your horses.

Bermuda hay runs about 5% protein and tends to not be very digestible for either babies or geriatrics because of its coarseness as a mature hay. It also tends to "rope" in the *cecum* causing occasional colics. If it is too fine and immature, then it has insufficient fiber and can wad or compact in the gut. It also is fairly low in calcium. Some vets do not consider it an option.

Bluegrass has long been considered one of the finest hays available although it tends to be as high in protein as alfalfa so perhaps use it solely in a mix with lower protein hays. Originally grown in KY on limestone-rich soils, its mineral content was the back-bone of the TB community. Be wary of some modern growers, both there and in other parts of the country, who have gone to high nitrogen fertilizers.

Brome is about 11% protein and is good for mid-or early-bloom; if cut later, it can contain too much fiber for many horses and can become too low in protein. It has a Ca:P ratio of about 1:1.

Clover is a legume like alfalfa and so preferably would not be included in any hay or hay mix. It can also harbor *endophytes* or fungi which can cause severe illness, sometimes death, in horses, especially pregnant mares.

Crested wheatgrass requires a lot of moisture, and has to be cut pretty early or it is very coarse and fibrous; it is about 8% protein.

North Park hay has long been considered the epitome of fine hay in CO. It used to be shipped around the country for all manner of competitive horses. However, poor growing practices, increased fertilization and irrigation practices, and reseeding, has compromised its excellence to some degree. While there is still a supply of superb hay coming from the region, be wary of multiple cuttings as those simply do not occur with high-altitude, cool-climate, natural grasses that take most of the summer to develop. If someone says they will ship you hay in June or July, it very well may be from last year's crop. Mountain hay tends to have excellent protein values and be abundant in minerals.

Oat hay is a grain rather than a true grass and is usually headed out before it is cut. Oats contain *avenin*, a central nervous system stimulant that can send many horses sky high when consumed in hay quantities. It, and wheat hay, are highly discouraged.

Orchardgrass is a fine stemmed grass similar to brome in its protein levels but without the drawback of becoming too fibrous.

Peanut hay is another legume hay so definitely discouraged.

Prairie grass is a mix of wild grasses; essentially what horses evolved upon. While it can be an excellent hay, many modern horses, used to very fine-stemmed timothy, etc., may not be too eager initially to eat it but eventually will take to it. It takes longer to chew and may be too coarse for babies and tooth-challenged geriatrics. Also, it's protein level may need to be raised for modern horses by feeding extra **HES** to babies and hard-working stock. Prairie hays tend to be very high in minerals resulting in notably less consumption of the ***DYNAMITE***® **Free-choice** offerings of **NTM Salt**, **1-2:1**, and **Izmine**.

Rye is on the high end of the carbohydrate scale and is prone to *endophytes*.

Sorghum & Sudan contain *prussic acid* capable of causing *cyanide* poisoning such as happened in KY with lost foal crops. A Sudan study at WSU showed that horses lost weight, muscle and topline at such an alarming rate that they ended the study early.

Timothy is a fine-stemmed, low carb, low protein grass hay; good especially for insulin-resistant horses. It has approximately a 2:1 Ca:P ratio. Because of its low protein level, some **HES** may need to be added for lactating mares, growing babies

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and working horses.

Hay pellets and cubes can be a necessity for geriatric horses in order to provide the necessary fiber when they cannot chew very well. Check with your local feed store to find a source that has a good grass mix with no alfalfa or grains and that is from good fields. Also check our sidebar for sources. Since timothy pellets have a lower carbohydrate rate than some other hays, we consider them preferable for most horses. Unfortunately, some manufacturers use marginal to poor hays for their pellets/cubes while others, the preferred ones, grow specifically for the pellet/cube market. Many cubes also contain far too many foreign objects in them such as baling twine, twigs, etc. for us to be very enthusiastic about them in general.

When feeding hay pellets of any sort, however, do soak them thoroughly, especially for geriatrics who have lessened salivary capacity, to reduce the possibility of choke. All ***DYNAMITE®*** pellets readily break down with moisture, but many hay pellets require long soaking. This is especially important in the winter when many horses just refuse to drink enough water. In such cases, add ½-1 oz **DynaSpark** to the mixture, using about 1 gallon, or more, of soak water. And of course, never forget the **DynaPro** each feeding!

HAY ALTERNATIVE CONTACTS

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- China Depot, Rhode Island, www.chinadepot.com 401-725-8141
- Sterrett Brothers Hay and Feed, Washington, www.sterrettbroshayandfeed.com 425-822-9011
- Farmer's Mill and Elevator, Minnesota www.assurancefeed.com 800-645-5648
- Hubbard Feeds, Minnesota www.hubbardfeeds.com 507-388-9400
- Seminole Feeds, Florida www.seminolefeed.com 800-683-1881
- Lucerne Farms, Maine www.lucernefarms.com 800-723-4923
- Ontario Dehy, Canada www.ontariodehy.com 877-289-3349
- Triple Crown Feed, Minnesota www.triplecrownfeed.com 800-451-9916
- First Thunder Feeds, Colorado 800-361-7080

We have even heard of various creative individuals successfully using a chipper/shredder from the garden store to run their good grass hay through or even spreading hay on the lawn and running over it with a lawnmower a couple of times in order to make the hay available to their geriatric. Whatever works for you!

Rather than the popular senior pellets containing hay, lots of alfalfa, oils and animal fats, preservatives, colorings, and other ingredients we prefer to avoid, we suggest some timothy hay pellets along with ***DYNAMITE®*** **PGR**, top-dressed with an ounce of ***DYNAMITE®*** **Regular** and perhaps some **HES**, especially if the animal requires more caloric value. For insulin resistant animals, use only **HES** rather than the **PGR**. Or for those horses requiring joint, muscle and nerve support, such as most geriatrics, use **TNT** instead of the **Regular**.

One unusual option for those in areas where only alfalfa, which has too much protein and too much calcium to be fed as a full hay diet, is available, try finding some really good sweet smelling, clean ***straw*** (wheat, oat or barley) and mix that with the alfalfa about 50:50. According to Horse Journal, this mix will, when fed at appropriate amounts for each horse, *"bring calories into the range of a good-quality grass hay, dietary crude protein 10-11%, and the calcium:phosphorus ratio improves from 7:1 down to about 3.5:1, which is within a tolerable range for an adult horse if the total amount of phosphorus in the diet is adequate."* We suggest providing ***DYNAMITE®*** **1 to 1 Free Choice** to ensure adequate phosphorus and to bring the ratio down to the even more acceptable one of 1-2.5:1. Of course, all should be offered anyway: **NTM Salt, 1 to 1, 2 to 1** and **Izmine**. Also, a straw mix still may not be appropriate for babies or weanlings who might require hay pellets if grass hay is unavailable.

Ultimately, there is no supplement program in the world that can fully make up for a lack of good hay. For the long-term health of your horse, save your money and go for the very best, chemical-free grass hay you can find, remember to have it tested for nitrate levels, ship it in if necessary, and feed it free-choice; that is what equine guts require. We believe that if you really cannot afford good hay fed in this manner, which is essential to minimal equine well-being, then perhaps you might have to rethink your ability to commit at all to equine care. ■