

This information was generated by Gold Director Rowan Emrys, C.N.M.T., an independent distributor for DYNAMITE® Specialty Products. The views expressed herein do not necessarily reflect those of DYNAMITE® MARKETING, Inc. No claims are expressed or implied, and this information is not intended to diagnose, prescribe or cure.

Horses evolved on grassy plains and still need to graze, or forage, on grass in order to function properly. Whether they graze in paddocks, pastures or on hay (all such grazing material is termed “forage”), their requirements and the result of meeting those requirements, is the same. Misunderstanding of this most basic need of horses is the root cause of many of their modern ills.

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 including but not limited to:

- a general “bad attitude” & nervousness or “cinchiness”
- scratches (open sores occurring on legs/pasterns associated with photosensitivity)
- thumps (a rhythmic spasm of the diaphragm) up to tying-up (muscle fatigue/spasm)
- OCD (OsteoChondritis Dissecans) and DOD (Developmental Orthopedic Disease) in foals
- thyroid dysfunction
- kidney disease
- regular colics/impaction
- *enteroliths* (intestinal stones formed from *ammonium magnesium phosphate*)
- arthritis/joint disease

These, and more, trace directly back to nutritional imbalances caused by excess alfalfa. Because most of these conditions originate in malnutrition, they can be reversed by simply switching over to good, natural grass forage. We have seen this occur time and again. Unfortunately, developmental challenges such as OCD and DOD cannot be rectified by dietary changes although it can make a difference for future foals out of the same mare.

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, increased tendency to fractures, and the OCD/DOD mentioned above.

Mature working horses require a protein level of only 12% maximum and 10-11% minimum; 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, or tying up.

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* (acidic pH) 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 while weakening all cellular structures including bones, ligaments, tendons and teeth. The acidosis or pH imbalance can also, in and of itself, lead to colic, ulcers, and even a severe dearth of beneficial bacterial colonies in the intestine; these colonies are a horse’s first line of defense against parasites and harmful bacteria.

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 with sensitive horses, amounts of alfalfa can also cause founder or laminitis. No horse who has *ever* foundered should have alfalfa (or grain) at all. Likewise 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% alfalfa in their forage.

GRASS

Grass is *the* natural feed for horses and is what their digestive systems require. 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 . . .*”

Grass also contains natural high levels of organic

silica necessary for bone and connective tissue (collagen) to be properly formed and for calcium absorption. In fact silica has been referred to by some as a “pre-calcium.” Since bone is a living organ, it is constantly being reformed and silica content is vital for proper mineral balance for that to happen. Natural grass hay also tends to keep the sharp edges of equine teeth worn down and, according to a University of Florida study, also is the best preventive of sand colic being even more effective than psyllium.

Feeding good grass hay can have a profoundly positive effect on a horse’s health and well-being. However, even grasses and grass hays require awareness to feed properly. It is important to always feed the best, most natural grass you can find that is unfertilized and even un-irrigated since such water can be contaminated with industrial toxins such as fertilizers.

Examine all forage (hays, pastures, turnout) 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.

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 about fertilizing practices. 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.

Regardless of what you are told by the grower, the broker or the feed store, **ALWAYS HAVE YOUR GRASS HAY TESTED:**

- Low protein content can easily be rectified by feeding about a quart of soaked alfalfa pellets for lunch for those horses who can tolerate it. For those who cannot, usually 1-2 cups per day of **DYNAMITE HES** is enough to bring protein level up to the necessary 12%.
- Low or imbalanced mineral content can be rectified by offering all four of the **DYNAMITE Free Choice Minerals (Izmine, NTM Salt, 1 to 1 and 2 to 1)** which horses will ingest according to their individual needs.
- Nitrate levels are not usually included in the test unless specifically requested and yet this is the most im-

portant test you can have performed. High nitrate levels are caused by using high nitrogen fertilizers, very common in growing grass hays, especially when growing for multiple cuttings; it also makes the grass look very green. However, high nitrate levels in hay cause *nitrosis*, or nitrogen poisoning, which is an inability to carry oxygen in the blood. Low oxygen levels can affect behavior (essentially brain damage due to lack of oxygen), gestation (mares can abort—we lost 3 babies one year this way), and coat appearance (due to suppression of Vit A). And, since high nitrates can also suppress copper assimilation, immune systems can become compromised especially in dark horses who require higher copper levels anyway. One sign of copper insufficiency in a horse is a reddish cast to normally dark coats. High nitrate hay can, but not always (ours didn’t!), feel rather brittle or rough, breaking easily rather than having that sort of springy feeling that grass hay should have. High nitrate hay is unfixable and should never be purchased.

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 which are addressed elsewhere) require virtually free choice access to grass hay. Kentucky 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. Horses are not referred to as “hay burners” for nothing! By the way, all hay should be fed at ground level *only* (old tanks, rubber mats, etc.) or risk cervical problems from stiff necks to thyroid inhibition; horses are *grazers* and not *browsers* although they will grab an occasionally treat from a tree or shrub.

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 summer. Contrary to popular belief, grass hay actually generates far more heat in the digestive process than either alfalfa or grain, so our winter use is higher than in more tropical climates. Generally speaking, the most cost-effective way of purchasing hay is by the semi-load (approximately 20T± - buy with a neighbor if you have less than 5 horses) 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, regardless of quantity, is priced by the bale, although occasionally semi’s will go over scales providing you with tonnage pricing. Since bale

weights can range from 30# to 85# or more, it is wise to figure your cost by the pound rather than by the 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, 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 of what was actually delivered; 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; you can, too. And yes, we test all hay.

GRASS HAY VARIETIES

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

The ultimate "goodness" of *any* hay is dependent upon health of the soil, fertilization procedures (**DYNAMITE HumiZyme** soil is the best possible), maturity at cutting, baling techniques, etc. "Good" grass 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. 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.

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. More importantly, usually the mix is not standard throughout the field 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 a particular low-protein hay, 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 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 nutritional needs of your horses. This is the method we prefer.

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 even 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 and is generally considered an excellent choice.

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 and so could use a bit of beefing up if it is the only choice available.

North Park & mountain 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 field management, increased fertilization and irrigation practices, and reseeding with mono-culture grasses, has compromised its excellence to some degree. While there is still a supply of superb hay coming from mountain regions, 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, or speaks of multiple cuttings, it very well may be from last year's crop, from heavily fertilized fields, or a scam. Mountain hay tends to have excellent protein values and be abundant in minerals. We consider real mountain mix to be a superior choice.

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 affect many horses' attitudes (makes them "hot") when consumed in hay quantities. It, and wheat hay, are utterly discouraged.

Orchardgrass is a fine stemmed grass similar to brome in its protein levels but without the drawback of becoming too fibrous. An excellent choice overall, especially in a mix.

Peanut hay is another legume hay so definitely discouraged.

Prairie grass is a mix of wild grasses; essen-

tially 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, its protein level (testing will tell you) may need to be augmented by feeding extra **HES** to babies, broodmares and other 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**. This can still be an excellent choice and is our second personal favorite hay.

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

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. Stay away from these even in mixes.

Timothy is a fine-stemmed, low carb, low protein grass hay. Perhaps insufficient in protein for most horses, its low carbohydrate value is very desirable, and recommended, 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, working horses and even IR horses where the extra fat in **HES** is very appropriate.

Hay pellets and cubes can be a necessity for geriatric horses in order to provide 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; timothy makes excellent pellets/cubes. 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!

We have even heard of various creative individuals successfully running their hay through a garden chipper/shredder machine or even spreading hay on the lawn and running over it with a lawnmower a few times

in order to make the hay available to their geriatric horse. Whatever works for you!

Rather than the oh-so-popular senior pellets that one sees everywhere (essentially hay/alfalfa with lots of oils and animal fats, preservatives, colorings, and other ingredients we prefer to avoid), we suggest some soaked 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 (IR) animals, use only **HES** rather than the **PGR**. Or for those horses requiring joint, muscle and nerve support, such as most geriatrics, add **Free & Easy** to, or ideally 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 closer 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 adequate amounts of at least *good* hay. For the long-term health of your horse, save up your money and go for the very best, chemical-free **grass** hay you can find even if you have to ship it in, remember to have it tested for nitrate levels, and feed it free-choice; this is what equine guts require.

Bottom line is that we believe that if you really cannot afford good grass hay fed in this manner which, along with a plentitude of fresh clean water, is essential for absolutely minimal equine well-being, then perhaps you might need to rethink your ability to commit to caring for a horse at all. After all, from this base, the cost of equine management will only rise. ■