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MYTHS AND WIVES' TALES OF FEEDING HORSES "SOME TRUTH, SOME FICTION"

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"Oh, but if you don't soak beet pulp before you feed it, it will swell up in the stomach and cause it to rupture." This is but one of the countless wives' tales concerning the feeding of horses. Almost every one has been exposed to these tidbits of wisdom that "everyone that has fed a horse surely knows." There are more of these anecdotal, pseudo-true myths surrounding horse feeding than seen associated with any other class of livestock including man. Where do these truisms come from, are they founded in any fact, why do they persist and does it really matter? In this paper I would like to discuss a number of the more prevalent myths and wives' tales and at least from my perspective "set the record straight." We might as well start with the oldest and most common of them all!

"Bran mashes"

Since I can remember I have been told that there is nothing better for a horse than an occasional bran mash. To tell you the truth, I was 30 years old before I even knew how to make one, have had horses all of my life and have yet to make one! Bran mashes are made in a number of ways and one could write a pretty lengthy book entitled "recipes from around the world for bran mashes." Most of these mashes at least have one thing in common, they contain wheat bran. Most are made with hot water, wheat bran, perhaps some oats or even some sweet feed and corn, soy or safflower oil, maybe even some boiled flax seed.

Wheat bran has been thought to have a laxative or mild cathartic effect. Research has failed to indicate that this is the case. A study conducted at Cornell University in which 50% wheat bran was added to a diet of hay and grain found that fecal moisture was not different between horses receiving wheat bran and those on the control diet that received no wheat bran. Furthermore, the digestibility of wheat bran was not affected by soaking in warm water. Another reason some cite as a reason for feeding bran is that it is high in fiber. Indeed bran is higher in fiber than, say, corn. But oats are actually higher in fiber and certainly all hays are higher in fiber than is bran. So if bran is not a laxative, does not contribute significantly to fiber intake and does not impact positively on fecal moisture when water is available to the horse, is there any

positive side to the practice of feeding bran mash? Perhaps the only thing one might see as a possibility, is the water a horse consumes via the bran mash. In cold environments, when water intake may be sub-optimal, this could provide some insurance in terms of maintaining hydration. But, if heated waterers are available this advantage disappears. Bran may also provide some nutrients to the horse, though there are usually more effective ways to get this job done!

In the final analysis, bran mashes are innocuous but do not provide the “magic” oftentimes attributed to them. If a horseman gets a warm fuzzy feeling by doing a bran mash or, more importantly, gets the whole of good stable management done more effectively, then by all means feed the bran.

“Beet pulp must be soaked prior to feeding”

This is an often expressed opinion of “horse nutrition experts.” The rationale behind the thought that one should always soak beet pulp is based on the water holding capacity of shredded beet pulp and the fact that the volume occupied by beet pulp after soaking is especially greater than that occupied by the dry stuff. Further, it is surmised that if one feeds dry beet pulp it will absorb water in the form of saliva in the esophagus and gastric juices in the stomach, swell up and then cause either choke or gastric rupture. Helmut Meyer, a noted German researcher, would subscribe to the latter theory and maintains that feeding beet pulp is a risky practice.

There have been literally thousands of tons of high beet pulp feed fed to horses (i.e. Replete, Respond, Complete Advantage, Sweet Rely), the majority of it fed straight out of the bag without being soaked. I have never (I know, never say never) heard of a horse choking or busting a gut due to these feeds swelling up in the stomach. So is there some explanation for the difference of opinion between myself and Dr. Meyer? The answer is, possibly! The high beet pulp feeds that we characteristically would see on the market range in molasses content from 20-30 %. It is probable that this amount of molasses does two things in the feed. First, the beet pulp soaks up a great deal of the molasses and swells to some extent and second, the molasses coats the beet pulp which prevents it from absorbing saliva and swelling in the esophagus.

Although I have mixed shredded beet pulp with sweet feed on my own farm with no problem, when I mix it with oats on the farm I generally would add some water just to be on the “safe side.” This is one of those situations that calls for a bit of a “better safe than sorry” attitude even though my experience suggests that the soaking is not necessary.

“When I feed my horse high protein feed it goes *DITZO*”

All over the world this is one of the most frequent questions/comments I get. My general reply would go something like this: “There are no data, either scientific or

otherwise, which would suggest that protein concentration or intake has anything to do with mental attitude.” But there is actually a twist to this query. Many times the second retort is, “But when I feed my horse more feed it make him really spooky.” This defines the problem many horsemen have in differentiating between energy and protein. Still, even after volumes have been written about a high protein (relative term) feed not necessarily being a high energy feed, people labor under the misconception that high protein means high energy means ditzo horses. NOT TRUE.

“Corn/oats are a heating feed”

This myth actually has two interpretations according to how one defines heating. When some people say this they mean temperature hot while others mean mental hot! First and easiest things first, let’s address body temperature. If we think back about basic digestive physiology and the energy diagram, we remember the terms heat production and heat increment. Heat production is the sum of net energy for maintenance and heat increment. Heat increment is also referred to as specific dynamic action or heat of nutrient metabolism and is the heat associated with the digestion and metabolism of various feed stuffs. Feeds that are higher in fiber have a greater heat increment because it takes more work to digest these feeds, hence the heat involved in digesting fibrous feeds in the winter time is a valuable source of heat to regulate body temperature. If one were to rank nutrients from highest to lowest heat increment the rank would be as follows; fibrous feeds such as hay (higher the fiber, the higher the heat increment), concentrates and the lowest, fat. This is why in hot environments fat may be added to livestock diets and does not appreciably add to heat load. When temperature increases feed intake decreases and as such energy density must increase to maintain growth and productivity. Increasing fat level in the diet is the easiest way to both increase energy density and decrease heat increment of the diet. One would therefore conclude that both oats and corn would be less “heating” than hay. The flip side to this coin is related to the effect of body insulation, especially fat, on body temperature regulation. Unfortunately, I have first hand experience with how increasing fat cover can increase heat load during exercise. If a horse is being fed more energy than required and is storing fat, increasing insulation, then certainly they get hot. This is not due to the dietary constituents, but rather to the amount of feed being fed and level of fitness of the horse. So are corn and oats heating feeds (temperature)? NO.

With respect to the other definition of hot, mental ‘hot’. Most people that feel that their horse’s mental attitude is bad because of feed are drawing a corollary between the sugar and hyper child syndrome and the behavior problems they see in their horses. Again a part of this is the observation that “when I feed more grain, my horses get high.” My typical response is, “You have basically two choices, you can train a horse into submission or you can starve him into submission.” One would expect a horse to feel better, if they are in a positive energy balance. The key is to direct this “energy” in a positive fashion resulting in superior, more brilliant

performance. Especially in the western pleasure horse industry five years ago, some horses were fed too little to make them go slow. They were lethargic, sluggish and really felt bad and as consequence did not want to go anywhere. As a judge, I was instructed to not place any horse that looked “intimidated or emaciated.” Finally this trend in training western pleasure horses is beginning to lose its popularity.

Even though I do not subscribe to the opinion that feeds make horses high, I do think that more work needs to be done in this area. What impact, for instance, does a high carbohydrate meal have on requirements for B-vitamins (thiamine) and if the requirements for these vitamins are not met is there a concomitant deterioration in disposition/nervousness? Certainly one could construct a pretty convincing story to this effect. Until more definitive research is done, I am inclined to not believe that starch/sugar intake per se have anything to do with a horse becoming hyper beyond the effect that the increased calories have. Interestingly, there was a recent paper in the Journal of the American Medical Association that compared hyper children fed sugar to those not receiving sugar and found no difference in the degree of hyperactivity! There goes another truism of behavior and diet.

“I want a feed that gives my horse energy but does not make him fat”

I want one of these feeds for myself, too! Would it not be great to be able to eat all of the energy giving food (especially if it tasted good) you wanted and not get fat! Again, we are dealing here with a lack of knowledge about energy balance. Dietary energy not required for maintenance is available for productive functions including growth, lactation, work and fattening to name a few. Put simply, if caloric intake is greater than caloric expenditure the result is fattening. More frequently than not the people that ask for these products are owners of easy keepers that many times do not get adequate exercise. “My pony is fat and does not want to go. How can I give him more energy?” When I’m fat I don’t want to go either! Sadly, this lack of GO is a result of inadequate physical conditioning rather than lack of energy intake. The best solution for most of these cases, whether human or animal, is more push-aways and more push-ups (push away from the table and push up the hill).

“Molasses causes colic”

This is a commonly heard wives’ tale that is not based on fact but needs to be qualified. Molasses used in the manufacture of horse feeds is predominantly sugarcane (blackstrap) or sugar beet molasses or may be blends of these and various fats or oils. Molasses is classified historically as an energy feed and has a digestible energy (DE) value similar to oats (3.4 mcal/kg) on a dry matter basis. Molasses ranges from 70-80 % dry matter and depending on source of the molasses may contain from 0.5 to 7% protein. By far the largest component of the dry matter in molasses is sugar,

which explains the high DE value of molasses. Molasses is used most frequently in feeds for its effect on palatability, and on improving the homogeneity of the feed. It reduces sifting out of ingredients, dustiness and fines.

So why is it frequently said that molasses may cause colic? There are two obvious relationships that molasses may have to digestive upset. Especially in hot environments, (and depending on the brix of the molasses), there is a greater tendency of “sweet feeds” to mold than in the case of pelleted feeds or dry mixes. Part of this problem can be eliminated by using some mold inhibitors in the feed and/or molasses. Many molasses contain some propionic acid to deal with this problem. The other and more obvious question one must deal with is the possibility that the amount of sugar in the molasses will overwhelm the ability of the small intestine to absorb glucose, resulting in some of the glucose (sugar) reaching the cecum where it would be fermented, much like starch that escaped digestion in the small intestine. I really do not think that this is a valid argument considering the amounts of molasses that are frequently fed in many sweet feeds. Most sweet feeds contain only from 5-10% molasses. Again we can go back to the example of the feeds containing large amounts of beet pulp. These feeds contain on average three times the molasses that a typical sweet feed would contain and are actually used in many cases in horses that chronically colic. So, even though one might jump through some hoops and come up with a reason that molasses might cause colic, the reality is that it is very doubtful if it does.

“Pellets cause horses to choke”

This wives’ tale is a holdover from the days when people were trying to find ammunition to justify not feeding pellets. There is no reason at all to think that horses are any more likely to choke on pellets than on any other physical form of feed if they are fed and eat in a normal manner. If, on the other hand, horses bolt their feed there is as great a chance that they may choke on pelleted feed as on other forms of feed. The solution to the problem of choke is to feed in shallow, rather than deep, feed troughs. For the aggressive eater, several large smooth stones should be placed in the feed trough. This requires the horse to sort around the rocks to eat and therefore rate of intake is slowed. There is every reason to believe that if there is not some kind of esophageal pathology which prevents normal peristalsis, there is no difference in choke rate between types of feed.

If there is something wrong with the esophagus, the best way to feed the affected horse is to make a gruel or very liquid mash out of the feed to be offered. I have been involved in several cases of this sort and have found that dissolving pelleted feeds, adding some corn oil and even using some dissolved alfalfa pellets to provide some fiber, is an effective way of meeting nutrient requirements. I have used this strategy in the short term while esophageal lesions heal and in the long term where there are permanent esophageal strictures.

“Crimped oats are better than whole oats”

There is a pervading opinion among horsemen that crimped oats are significantly more digestible than whole oats. Most of the digestibility studies that have been conducted comparing crimped and whole oats indicate that there is at most a 6% increase in the digestibility of crimped oats when compared to whole oats. In addition to the total tract digestibility experiments that have been done, Meyer in Germany has recently reported that the difference in the preileal digestibility of oat starch from whole and rolled oats is minimal. This indicates that there is in most cases no real justification for using crimped oats over whole oats. The only time when this may not hold true is for older horses with bad teeth and perhaps for very young horses. For the older horse a pelleted or extruded ration is more appropriate anyway, so this may well be a moot point.

“If horses are getting *pot bellies* deduce their grain intake”

This is a common one. Many times people mistake large bellies for fat and have a tendency to reduce the grain part of the ration. When one reduces concentrate intake, the horse is forced to rely more heavily on forage to meet nutrient requirements and may show an increase in the size of the barrel. However the real cause of hay bellies in many horses is a loss of condition down the top line that makes the barrel or belly appear to be bigger than it really is.

In many instances, one may help this situation by increasing the amount of concentrate that a horse receives along with an increase in exercise. If one really thinks about it, the main times when a horseman complains about hay bellies are in young horses just post-weaning, or in mature horses that are on pasture and receiving little exercise. Rarely do we hear complaints from a racehorse trainer (most race horses are receiving about 15 pounds of hay and from 12 - 15 pounds of concentrate) or from trainers of other high performance horses. Also, people fitting halter horses rarely have queries about big bellies.

Horses tend to deposit fat over the crest of the neck, behind the shoulder, over the ribs and over the croup and tail head, not on the underline as a human might do. I have seen far more hay or pot bellies on thin horses, ones that have little fat cover over the ribs, than on truly fat horses.

“I feed corn oil to prevent impaction”

(“sort of like my vet giving my horse mineral oil”)

Mineral oil is used when horses colic or founder for two reasons. First, mineral oil coats the gut which prevents the absorption of toxins by a damaged intestinal lining and second, because it does have a lubricating effect on the intestinal tract and allows the horse to pass a fecal mass. Additionally, mineral oil has a laxative effect as well.

What one must remember is that mineral oil is totally inert in the GI tract. There is

absolutely zero absorption of mineral oil and all of the “oil” gets back to the hind-gut to exert its effect. Corn oil or other vegetable oils (soy, safflower, canola etc.) on the other hand are very highly digestible. Vegetable oils are about 85-90% digestible. Furthermore, fat digestion takes place predominantly in the small intestine. These feed ingredient fats are emulsified in the small intestine by bile acids, micelles are formed and absorbed in the small intestine. Very little if any of these dietary fats make it into the cecum and large colon to act in a manner similar to that of mineral oil.

So, in essence mineral oil may indeed grease the chute whereas vegetable oils do not have this effect. An interesting footnote here is actually feeding mineral oil. It is probable that when significant amounts of mineral oil are fed, there may be some decrease in the absorption of the fat soluble vitamins but if anything feeding vegetable oils may enhance the absorption of these vitamins.

“I feed trace mineral salt - *that’s enough, isn’t it?*”

The typical trace mineral salt has a composition similar to that listed below:

Salt	- not less than 94%
Salt	- not more than 97.5%
Zinc	- not less than .350%
Iron	- not less than .340%
Manganese	- not less than .200%
Copper	- not less than .033%
Iodine	- not less than .007%
Cobalt	- not less than .005%

It is obvious that far and away the largest component of TM salt is salt or sodium chloride. This is not all bad as this is for many horses the only salt source that is available, but it does not do the job as far as trace minerals are concerned. Dr. Harold Hintz at Cornell University did a study in which the voluntary intake of a salt block was measured by repeatedly weighing a salt block after horses had access to it each day. Based on those data one would expect voluntary consumption to be from 1.8-2 oz. per day. Using the above composition of TM salt, intake of the various minerals would be as follows:

Salt	- 54.6 grams
Zinc	- 196 mg
Iron	- 196 mg
Manganese	- 112 mg
Copper	- 18 mg
Iodine	- 3.92 mg
Cobalt	- 2.8 mg

The intake of salt would come close to meeting the sodium and chloride requirements of the sedentary horse and if taken with forage, zinc, manganese and iron would be provided in an amount close to that required but intake of other nutrients would be negligible. For performance and young horses, a TM salt block alone falls short of really addressing trace mineral needs and their feed must be fortified to satisfy these requirements.

“High protein causes developmental orthopedic disease (DOD)”

One of the most common of the wives' tales revolves around the various and sundry syndromes that people attribute to protein. Maladies ranging from “too much energy” to growth disorders are all attributed to too much protein. In order to address these questions and comments, one must first understand why people are inclined to blame protein to begin with. Most people identify feed according to its protein level with little regard to the concentration of other nutrients in the ration. The question, “what do you feed your horse?” is often answered, “I feed a 14% sweet feed.” The horseman has immediately said the only nutrient that they really know anything about is protein. Therefore, when perceived problems arise this nutrient is the first thing that they think about. There is far too much emphasis on protein in the marketing and purchase of feeds and far too little emphasis on other important nutrients. There are no data to suggest that the protein concentration in concentrates has anything to do with the occurrence of DOD in young horses. Furthermore, there are times when the protein intake from concentrates may be only a small percentage of total protein intake. A classic example is the young horse in central Kentucky. These horses may receive (yearlings) eight to ten pounds of a 14 to 16 percent protein concentrate in the springtime, yet have ad-libitum access to pasture that might be from 22-26% protein. People pass judgement that it is the protein in the concentrate that is the problem, without even considering the nutrient concentrations in the pasture. Even more surprising is that many times a person that might be feeding a 14% protein feed may also be feeding a really good quality alfalfa hay and not realize that the protein concentration in that hay may be as much as 22%.

The fact of the matter is, there is far more justification for thinking that inadequate protein or an inappropriate protein:calorie ratio could cause these sorts of problems than for thinking that excess protein is causing problems.

“Free choice minerals allow the horse to eat what he needs”

There are some horsemen that still subscribe to the philosophy that says if “cafeteria style minerals” are put out, the horse will eat only those minerals that they need. There is no evidence that the horse has the ability to selectively consume those minerals

for which they specifically have requirements above what is provided by the basal diet. This would be slightly akin to saying that you and I are able to determine that our diets are deficient in a specific mineral and seek sources of that mineral. I can see myself deciding, based on some metabolic or physiological indicator, thinking “I believe I am deficient in copper, let me chew on a penny for a while” or “Oh no! my potassium status is marginal. I better eat a banana!”

There are, of course, perceived exceptions to this line of thinking. There is some evidence that animals may be able to regulate sodium and chloride intake if free choice salt is available. Additionally, a phosphorus deficiency is classically identified by pica, or an insatiable appetite. One must wonder if this deficiency symptom occurs after body phosphorus stores are already far below optimum levels.

It is far more appropriate to design livestock (horse) diets such that required intakes of minerals are achieved than to take the chance that animals are able to determine what they need and select sources of those nutrients to meet requirements.

“Horses that practice coprophagy are *missing something*”

I do not think that anyone knows why some horses eat their feces. There are probably several viable explanations. One could really assume that from an evolutionary standpoint this is normal rather than abnormal behavior. It kind of makes sense that the horse would view feces as another way of obtaining nutrients (i.e. extraction of nutrients from the feces or recycling nutrients such as microbial protein).

There are several instances when horses are commonly observed to practice coprophagy. The very young foal may be seen eating the feces of its dam, probably a method of inoculating the gut with bacteria. The horse on limited fiber or caloric intake may eat feces to fulfill a need for fiber and/or calories. In either instance, supplying adequate feed and/or fiber may or may not cause a cessation of the behavior. Most frequently adding fiber to the diet yields the best results as far as eliminating the habit of eating feces. Many times we find the show horse, especially the easy keeper on limited feed intake and on a sporadic and inadequate exercise program, to be more prone to coprophagy. One must think that this habit may be behavioral, and primarily a result of boredom and in some instances have may absolutely nothing to do with nutrition.

“New hay must go through a sweat before being fed”

A great many people think that hay must cure in the barn for a certain amount of time prior to being fed to horses. This feeling is probably due to the observation that hay sometime heats after baling. Hay heats due to continued respiration of the plant material after it has been cut. The extent to which this process continues is to a large extent a

function of the moisture content of the hay at the time of baling. One would expect a little continued respiration as soluble sugars in the plant tissues are broken down, but if too much heat is produced internal combustion of the hay may result in the hay barn burning down.

My general response to people is: If hay is heating enough that there is some hesitancy about feeding it to a horse, I sure do not want it in my barn! I have on numerous occasions gone and picked up hay out of the field in an afternoon and fed it to horses in the barn that evening and have never had any detrimental reactions. The other thing to consider is the fact that if there is adequate moisture to promote “heating” of the hay, then there is every chance that the hay also will mold to some extent. If the hay is going to heat and mold, I do not want to buy and feed it anyway.

“First cutting hay is not good for horses”

This may or may not be true! The accuracy of this statement depends almost entirely on the species or type of hay being fed/purchased and the maturity of the hay when it is cut. Many times hay producers get only one cutting of some types of grass hay so if you cull that cutting, then you are culling that type of hay. More frequently than not when this statement is made it refers to alfalfa hay. There is every chance that first cutting hay will contain more weeds and grasses than subsequent cuttings of hay and because weather conditions may vary, many times the first cutting of hay is taken when the plants are more mature than for later cuttings. If a hay producer does a good job of weed control and cuts each hay crop at the ideal stage of maturity, these differences disappear.

If a first cutting of hay is of similar or like nutritive value to that of later cuttings of hay, then there is absolutely no justification for rejecting it in favor of later cuttings of hay.

“Alfalfa causes kidney damage in horses”

This old belief requires no other discussion further than a loud and definitive NO! There are no data, scientific or otherwise that would indicate that the renal system of the horse is compromised in any way by the feeding of alfalfa hay. Again, people know that alfalfa is higher in protein than some other types of hay and as a justification for falsely indicting protein for a multitude of ailments, have added renal damage.

“Timothy hay is superior for horses”

Untrue! The hay that is best for horses is that hay that provides the best mix of nutritive value, economy and effective fiber. Timothy in fact is many times the most

expensive hay one can get. This is particularly true when the cost of nutrients is considered. There are many times that timothy hay may cost as much as \$300.00/ton on the racetrack and provide little nutritional value. Again, tradition and misunderstanding of the nutritive value of hay and forage rears its ugly head.

“Coastal bermuda hay causes colic”

There is no evidence to support this belief! Personally, I have fed coastal hay all of my life with no increase in the amount of GI upset over that experienced by horsemen that do not choose to feed coastal. My family raises coastal in Texas and are able to harvest more nutrients per acre using this hay than for any other appropriate forage crop that they could raise. Coastal Bermuda grass is very responsive to the application of nitrogen fertilizer and this is reflected in the variability one sees in looking at the chemical composition of coastal hay grown in different parts of the country or indeed within a given state. The rules for assessing the quality of coastal hay are the same as for any other type of hay.

Obviously, the list of misconceptions and myths surrounding feeding horses goes on and on. These are but a few of the more common ones. Hopefully by examining these truisms from an accurate and nutritionally sound perspective some of the misinformation can be corrected and these wives' tales dispensed with.

