Re: Better Management Protocol for Better Thoroughbred Health

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To Whom It May Concern:

The thoroughbred racing industry, particularly in North America, aims to produce the strongest and fastest racehorses possible. However, breeders, stable managers, and trainers fail to recognize that some of their practices are detrimental to the horses’ physical and mental well-being both on the racetrack and after retirement. “Off-the-track” racehorses are commonly associated with having problems originating in the gastrointestinal system that, for a horse, can be deadly. From this stems behavioral problems and high management costs, including supplements to ease the symptoms and veterinary expenses. It is clear that the current practices produce high quality racehorses but the effects of these practices are unfair to the horses and post-racing owners. If a new diet and management protocol were introduced, including high quality, high fat forage and less time spent in a stall, not only would the horses benefit physically and psychologically, but the costs of maintaining a thoroughbred for and after racing could decrease.

PROBLEM

The gastrointestinal system of the horse is built to sustain a grazing lifestyle based on a high forage diet. Not only must the stomach of the horse be exposed to high fiber food, but small quantities of food often (Harris 9). Horses in the wild or horses kept on free ranging pasture browse and graze for up to 18 hours a day (Thorne et al. 150). This lifestyle is crucial for the digestive health of the horse. The proximal third of the stomach is lined with nonglandular stratified squamous epithelium, which does not secrete a mucous layer to protect it from the volatile fatty acids (VFAs), pepsinogen, and hydrochloric acid secretions of the lower two-thirds of the stomach, composed of glandular mucosa. As a result, the upper portion of the stomach, which is actually an extension of the esophagus on the cellular level, accounts for 80% of gastric ulcers in horses. Equine Gastric Ulcer Syndrome (EGUS) is found in 60% to 90% of horses involved in training and racing. EGUS in thoroughbreds has been associated with poor performance, poor coat quality, unhealthy eating habits, and colic, a term used to describe gastrointestinal pain (Buchanan 375).
The underlying cause of colic is not necessarily EGUS. It is multi-factorial in nature and its annual costs, in the United States alone, are an estimated $115.3 million, where 66% of those costs were losses due to death (Archer 29). In most cases of colic, the gastrointestinal dysfunction is unknown because diagnosis can be difficult (30) and because of this, treatment can be difficult as well. The digestive tract in its entirety is an extremely large and complex system and colic can occur at any point, whether it is a lesion, a blockage, or a build-up of gas. It is especially hard to diagnose a problem that is deep within the intestinal tract, since the problem can be inaccessible from either end of the animal. Most cases are diagnosed as spasmodic/gas colic or colic of an unknown nature for lack of better diagnosis (Archer 30).

The occurrence of EGUS in thoroughbred race horses may be caused by the anatomy and physiology of the equine stomach during heavy exercise. Horses involved in race training have been shown to be at increased risk since they are constantly undergoing the stress of training and consuming a diet that is conducive to damage. Research has revealed that horses running on high speed treadmills experience an increase in abdominal pressure and a decrease in the volume of the stomach. Horses involved in intense training regimens are especially susceptible to this and as the stomach contracts, the acidic contents of the lower portion of the stomach may reflux into the upper portion, causing a breakdown of the nonglandular epithelium. In addition, exercising horses have an increased concentration of serum gastrin, a chemical responsible for signaling an increase in glandular hydrochloric acid secretion (Buchanan 577). Feeding intermittently and with high-quality forage may decrease the probability of gastric ulcers and colic episodes. The acid levels in the equine stomach spike several times throughout the day without having to be exposed to exercise or food and, similarly to humans, if there is nothing present for the gastric chemicals to break down, breakdown of the lining of the stomach may occur (Williams).

Horses kept in stalls are generally at risk for both psychological and physical damage because the stall environment does not allow them to exhibit natural behaviors nor consume ample grass and other forage required for proper gastrointestinal health. Horses that are stalled and fed in “meals” rather than having a consistent source of fibrous feed display behavioral stereotypes not seen in horses kept in pastures with constant exposure to forage. In the stall, the horse is completely dependent on its caretaker for when, how, and what kind of food is presented. Often times, the meals are energy-dense (high sugar concentration), low fiber grains with little forage. Stereotypical behaviors can be a result of not having forage available to occupy time (Thorne et al. 150). Behaviors include crib-biting, windsucking (Archer 31), and weaving. Crib-biting and windsucking may be related to colic indirectly, by either illustrating gastric irregularities or poor management practices. A study in 2002 reported that foals that exhibited this behavior less when supplemented with antacids (32). There may be temperament issues associated with these behaviors, which may account for poor performance in racehorses (Thorne et al. 151).
PREVENTION METHODS

There are several ways to reduce the risk of colic and EGUS that, coupled with proper diet, may result in long term benefits for the animal. Learning the physical and behavioral characteristics of each individual horse can be an excellent way of managing colic. Noticing a change in eating habits or behavior can be a sign of colic, and the earlier it is detected, the better chance of a hasty recovery. Horses with a history of colic are associated with an increased risk of further episodes (Archer 32), so solving the problem early on is beneficial. This will also aid in establishing an exact method of feeding for each horse.

Stress can have a significant impact on the digestive health of the thoroughbred. This includes both physical and mental stress from training and racing. In order to reduce stress on the digestive system, a suitable diet plan, once established, should not be changed. It takes approximately two weeks for the digestive system of the animal to fully acclimate to a new diet, and the diet change, only if necessary, should be introduced slowly. It is common practice to provide the animal with a different form or an increased amount of forage on race day because it is easier for horses to consume hay while on a trailer and at the racetrack (Williams). This may put a great deal of stress on the digestive system, among other physical and mental stresses that are involved in race day including a new environment, unknown horses, noise levels, and nervousness. In 1997, researchers reported an increased risk of colic in horses that were exposed to diet changes more than once a year. A recent change in type or amount of grain or concentrate was also associated with an increased risk (Archer 34).

If EGUS is diagnosed, drug therapy should be initiated in an attempt to heal the gastric ulcers. Current treatments focus on blocking gastric acid secretion and raising the pH levels of the stomach to a less harmful level (pH<4). GastroGard is the only FDA-approved pharmacological treatment for EGUS, but there are several other drug therapies available. Some ulcers may heal spontaneously, but for horses still in training, acid suppressive therapy through use of GastroGard or other drugs such as omeprazole or cimetidine may be administered (Buchanan 582). Histamine type-2 receptor antagonists do not allow acid secretion in the stomach by taking the place of histamine and binding to the histamine receptors that are responsible for acid secretion from parietal cells (583). Sucralfate and bismuth subsalicylate are compounds that bind to stomach ulcers and encourage healing (585). A safe combination of acid secretion blocking drugs and drugs that help to heal ulcers may be employed. Some therapies include supplements rather than drugs. Adding rice bran to a diet may not only increase the fat intake and energy output of the animal, but it may also decrease the risk of blockages that can occur (Williams).

PLAN

Establishing a suitable diet from birth may help to avoid EGUS completely. Studies have shown that in the 60-150 day period after foaling (birth) there is an increased risk of colic (31). Keeping growing foals and yearlings on a diet of alfalfa hay (fiber source), which is
high in protein (14% to 16%) for the building of muscles and calcium and phosphorus for the growth of bones, will not only provide the foal with the nutrients to grow (Williams), but it has shown to increase the pH level in the stomach, producing fewer ulcers (Buchanan 578). Alfalfa hay also has a high fat concentration. Fat is a dense source of energy, natural lubricant for the digestive system and coat conditioner. Fat is a better source of energy for training and racing than glucose (found in many traditionally used “sweet feeds”) because the body can still metabolize and store glycogen without breaking down glucose molecules rather quickly. During training, the animal will use the fatty acids obtained from the breakdown of fat molecules and have enough glycogen stores required for the short, 2-minute races they will run later in life (Williams).

This diet for foals will not only prevent gastrointestinal abnormalities, but it may allow the foal to grow more efficiently, primarily due to the protein and calcium found in alfalfa hay. At one year of age, horses are usually brought to auctions to be sold to trainers. The yearlings are judged solely on their appearance and pedigree since yearlings cannot be ridden or raced at that age. Trainers may be drawn to height, length, and heartgirth of the animal, since these measurements are positively correlated with lifetime earnings and win percentage (Smith et al. 212). A larger horse has a greater capability of increasing the distance covered per stride which would decrease the number of strides over the course of the race. A preferable horse is one that uses less energy to cover the race distance.

When the animal has finished growing, usually at the age of 3, a diet of 1/3 to 2/3 alfalfa hay to timothy or grass hay ad libitum is acceptable, feeding more alfalfa if the horse is in training. A heterogeneous mixture of hay mimics the diet of feral horse populations (Goodwin et al. 338). This mixture should keep energy levels high without having to feed an excessive amount of concentrates. Concentrates should only be fed in small amounts to balance vitamin and mineral levels for training (Williams). The diet must be well balanced to provide the animal with enough energy to store because at high work intensities (racing speed), the metabolic rate may increase up to 60-fold above the basal level (Hyyppa 114). In addition, a balanced diet may help to avoid colic episodes, the development of ulcers, and maintain a healthy body condition. Adjustments should be made varying from horse to horse because every horse has different nutritional needs.

If management situations allow for this, horses should be kept on pasture rather than in stalls for some time, if not for the entire day (Thorne et al. 151). Pasture-kept horses have been seen to be at a decreased risk for colic and EGUS, which may be the result of many causes, ranging from more suitable diet, lesser foraging practices, to exposure to other horses (Buchanan 578). Providing thoroughbreds access to pasture should produce normal grazing behaviors. If this management practice is not suitable for the specific facility, the stall environment should be enriched with toys and an adequate supply of forage, which should promote natural foraging behaviors (Thorne et al. 151). If possible, horses should be removed from stalls daily to either interact with other horses or humans. This can include turn-out with another horse or horses, or allowing the animal to graze outside. This, though simple, will provide the animal with enough psychological enrichment and health benefits to improve the quality of performance.
CONCLUSION

Finding a proper diet and maintaining it should occur at an early stage of a horse’s life, whether it is from the birth of the horse or the time the horse is purchased at auction. A diet rich in fiber, protein, and fat should allow the digestive system to function properly while still providing the animal with enough energy stores for training and racing. Horses whose digestive systems are not compromised may have the ability to utilize nutrients more efficiently, which can lead to proper growth and a satisfactory level of athleticism. Proper surveillance under both stressful and nonstressful situations may help in preventing minor colic episodes from becoming serious ones and potentially the development of ulcers all together. Keeping horses out of stalls for longer periods of time may also decrease the risk of gastrointestinal as well as stress issues. Thoroughbreds should be healthier on and off the track and not only will the horse benefit from this, but the trainers, jockeys, and owners will benefit as well.

Thank you for taking the time to read this proposal. I hope that you have found it inspiring as well as informative. The thoroughbreds are the foundation of the racing industry, so a way to manage them more efficiently should be high priority. With your help, trainers and breeders can become better educated regarding the current research being conducted in this field and the improvement of the health of the horses could be significant. If you have any questions regarding this proposal, I can be reached by phone at (732) or by e-mail at erleahy@eden.rutgers.edu.

Sincerely,

Elisabeth
References


Williams, Carey (Equine Extension Specialist, Cook College, Rutgers University), in discussion with the author, February 2007.