Proper management

How to minimize mental and physical stress for horse's optimal health and performance on the racetrack

by Amy M. Gill, Ph.D.

EVERY day, week, and month a plethora of articles concerned with the health of performance horses appear in various journals with recommendations on keeping each individual functioning at an optimal level. Commonly offered suggestions generally start with the following list of management techniques:

- Employ qualified veterinary and farrier care and routine management such as de-worming and vaccinating;
- Feed good quality forages and low starch, high fat, and fiber concentrates that are balanced and offered in the correct amounts to meet the optimal nutrient requirements;
- Provide access to fresh water and salt at all times which are critical for electrolyte and hydration status;
- Provide adequate exercise and access to turnout if possible. Both are now readily recognized as required to help prevent the development of stereotypic behavior or vices and keeping the digestive tract and the musculoskeletal system functioning properly; and
- Utilize various medications and supplements to help combat a host of disorders and unsoundnesses, with one of most common being a malfunctioning digestive tract. Most commonly included in this category are colic, gastric ulcers, and subclinical acidosis caused by too much starch in the hindgut, which can also lead to laminitis if left unchecked.

These basic suggestions are all warranted and accurate, but for the intensively managed racehorse, none will be totally effective if the level of stress the horse experiences while at the racetrack negates the benefits of good management.

Not all horses are so negatively affected by stress that they develop severe mental and physical problems, but a large sector of the population appears to suffer in varying degrees.

Therefore, keeping the psychological and physiological state of a racehorse in harmonious balance is the greatest management challenge of all and a key to optimal performance.

An examination of how stress from confinement, concentrated diets, and training can negatively affect the psyche of the horse and the subsequent trickledown effect that has on digestive health and the development of stereotypic behavior or vices should provide some insight.

Stereotypic behaviors

By now many have all heard the mantra of the horse being a grazing herbivore, designed brilliantly to survive eating low-quality, fibrous feeds such as bark leaves, twigs, grasses, flowers, herbs, and anything vegetarian they come across while munching happily for 18 to 20 hours per day in vast, wide-open spaces.

What also must be realized is what a dramatically different existence the racehorse is subjected to, especially because the desire to roam free in a large herd is still very instinctive in these animals. Amazingly, most racehorses and other horses that are confined to a stall for the majority of their time manage to adapt and function remarkably well, despite being fed energy-rich, low-fiber diets, feeding schedules convenient to their caretakers, and limited time to meander about freely outside the stall.

Most horses initially conform well to their new environment when they enter training. However, maintaining this level of adaptation over the career of the horse so that it remains in good health is an extremely difficult aspect of horse training and husbandry.

Initial stress

When the horse is put into training, it is separated from its herd-mates and isolated in a stall. Losing the security felt when coexisting with others in a field immediately makes the horse insecure about its surroundings.

The inability to see other stabled horses compounds the loss of security. Most racetracks have shedrow barns where the horse can see its neighbor only by standing at the front of the stall. A stall with only a front door and no windows also encourages the horse to lunge at passersby. Additionally, this activity may preoccupy a horse to the point it would rather engage in that activity than eat, which may lead to weight loss and contribute to the formation or worsening of gastric ulcers and ultimately poor performance.

Many trainers have water and hay outside the stall for this reason, and in some cases that may help. However, it is very difficult for a horse to twist its head around and up in the air to eat hay hung high above the head, and often the horse gives up eating very much hay at all because to do so requires such an awkward position. The position of the head when eating from a hay bag also predisposes the horse to accumulate particles of hay, dust, mold, and pollen in the eyes and respiratory tract and could possibly precipitate infections.

Most horses seem to enjoy feeling like they are grazing in the stall, and the ability to have their hay strewn about mimics grazing to some degree.

A hay bag on the outside of the stall keeps the inside of the stall tidier but does not help to make the horse feel like it is grazing.

The best solution would involve the horse easily being able to see his neighbors from anywhere in the stall and allowed to be "messy" with small amounts of hay fed frequently throughout the day so that he must move about to "graze." With this stabling design, much stress and anxiety could be relieved.

Perhaps as new barns are built and older barns are renovated on the backside, stall configurations can be designed to safely allow horses more visual interaction with each other so that stall confinement seems less like a stall and more like being in a field with herdmates.

Calming effect

The next biggest change for minimizing stress is adapting the horse to spending most of its time in a stall.

The horse ideally should be allowed to adapt slowly to being housed in a barn. This can be accomplished on the farm while being broke to a rider by increasing the length of time the horse stays in until shortly before it ships.

The inability to move about freely continuously and for long periods generally is the first stressor to seriously affect horses that are less tolerant of total confinement. Unfortunately, most racehorses are at racetracks where turnout space is unavailable. Some horses are stabled at training centers and are afforded the luxury of an hour or so in a small paddock or round pen on a daily basis, such as the setup available for horses at such places as Fair Hill Training Center in Maryland.

The image of the late Barbaro rolling in his pen three days after winning the Kentucky Derby Presented by Yum! Brands (G1), wearing four bandages and bell boots, was very impressive. However, if turnout is simply not an option, hand grazing, an afternoon session on the walker, hand walking in the shed row, or even a quiet hack are excellent for horses that are not relaxed in their stalls.

Maintaining a horse on low-starch and low-sugar feeds also will help it to remain calm when residing in the barn round the clock. Energy that was once expended while grazing, taking short sprints, and roaming around continuously is now conserved and can cause excitability.

Because high-starch and high-sugar rations cause increases in blood sugar for about four hours after each meal, individuals sensitive to this rise may become difficult to handle and restless in the stall. This type of diet also increases the risk of causing sub-clinical acidosis in the hind gut, a chronic condition that commonly leads to poor appetite, dull performance, and potentially colic and or laminitis.

Horses consuming diets high in sugars and starches may act similarly to young children with Attention Deficit Hyperactivity Disorder (ADHD).

Dietary studies consistently reveal that hyperactive children eat more sugar than other children. Reducing sugar has been found to lower the incidence of excitability in these children.

Other research has confirmed that the problem can be attributed to abnormal glucose metabolism as a result of changes in hormones in the brain. A study of 265 hyperactive children found that more than three-quarters of them displayed abnormal glucose tolerance, that is, their bodies were less able to handle sugar intake and maintain balanced blood-sugar levels.

As with a child who is regularly snacking on refined carbohydrates, sweets, chocolate, soda, juices, and little or no fiber to slow the glucose absorption (very similar to some racehorse diets), horses consuming high levels of starch and sugars also may have abnormal glucose metabolism. The inability to regulate blood glucose can cause an increase in excitability and changes in concentration and behavior.

This model fits well for the horse in training; fluctuating glucose levels as a result of too much starch and sugar in the diet and elevated plasma cortisol (hormone indicative of stress has an antagonistic effect on the action of insulin), the hormone responsible for the uptake of glucose from the bloodstream to be stored in cells.

Feeding forages and concentrates that do not cause fluctuation in blood-glucose levels (low-glycemic feeds or those with more fiber and fat) have been proven to help to control nervousness and reactivity in horses.

Interestingly, a dietary deficiency of Omega-3 essential fatty acids has been implicated as a contributing factor to ADHD in children. Modern horse feeds are extremely high in Omega-6 fatty acids (from sources such as corn and soybean oil) and low in Omega-3 fatty acids, causing an imbalance in the ratio of these two nutrients. Adding an Omega-3 essential fatty acid supplement to the ration of racehorses can help improve behavior, as well as increase immune response, decrease inflammation, enhance recovery from hard exercise, and improve the integrity of blood vessels and the permeability of cell membranes.

Living in confinement

Horses raised and kept in confinement are predisposed to developing abnormal behaviors. Stereotypic behaviors are those that are repeated sequences of movements, unvarying and with no obvious function.

Survey studies conducted in the United Kingdom demonstrated that one-quarter of the Thoroughbred population develops stereotypic behaviors to alleviate stress. While that incidence can be interpreted as high, it still leaves three-quarters of the population as having adapted fairly well to racehorse life.

Cribbing, stall walking, weaving, and wood chewing are the most common stereotypic behaviors seen in Thoroughbreds.

Most scientists agree that horses develop these behaviors as a means to cope with stress created from the environment in which it lives. Once developed, vices are nearly impossible to eradicate, but changing the conditions that caused the behavior to start can greatly reduce its incidence. Unless a horse engages in stereotypic behavior almost constantly, athletic performance is not affected by these behaviors. Horses that are so compulsive in a particular behavior that their health and performance are affected should be turned out and given a new career.

Offering the horse a variety of fiber sources is a good way to slow a horse from exhibiting stereotypic behavior and is the best way to keep the digestive tract function properly. Horses in a pasture have a variety of grasses, weeds, herbs, flowers, wood, and other fibrous feeds to consume. Feeding different types of forages, and perhaps even those of lesser quality that contain more fiber, may help keep the horse occupied and "grazing" more frequently. Low fiber intake combined with concentrated grain diets has been shown to increase the incidence of stereotypic behaviors in horses.

If the horse is a moderate wood chewer, offering a pine board mounted on the wall of the stall may satisfy the horse and prevent structural damage to the building. Pine is a very soft wood and easily chewed and boards can easily be replaced as needed. Trying to keep the horse from chewing with aversive tasting paints and anti-chewing devices is futile because the horse will find another area to chew.

However, if a horse is a serious wood chewer that would rather eat wood than its rations, a pine board is inappropriate. Some other aspect of the horse's management must be examined and a different course of action taken to help curb the behavior.

In general, some of the most effective methods of curbing vices are to allow the horse more freedom in a small paddock or round pen and/or the ability to see other horses and to provide more forage when the horse is in its stall. Increase the feeding frequency of concentrates to four or more small feedings per day. This encourages eating because horses like fresh feed in small amounts instead of stale feed. Increasing the feeding frequency of concentrates also has been shown to increase intake of forages.

A mirror mounted on the stall wall or supplying toys to a mentally challenged horse helps to relieve anxiety, as it sees another horse next door. However, there always will be some individuals where none of these methods are effective and the horse will still continue to exhibit the behavior when confined.

Stall walking and weaving are behaviors that are similar to what is seen in wild animals kept in a cage, in a zoo and exemplifies the animals' desire to be moving almost continuously as it would when roaming free. In horses, walking and weaving develop from a feeling of claustrophobia and isolation. Once developed, these behaviors cannot be stopped completely, and going to extremes with some methods, such as tying a horse continuously while in the stall, is exceptionally cruel and only will add to the stress already being felt.

Putting objects in the stall such as tires simply limits the area the horse has to walk or weave in but usually does not stop the horse from performing these movements. Again, keeping the horse stocked with a variety and plenty of forages, allowing the opportunity to safely interact with other horses, and more time out of the stall are probably the best solutions for a horse that has developed into a stall walker.

Cribbing seems to bother horse people as much as any other vice. In reality, cribbing is of little or no harm to the horse other than the wearing of his incisors used to grip an object while cribbing. It has been disproved that horses swallow air into the stomach predisposing it to colic.

Recent studies have suggested that cribbing actually helps alleviate some of the acidity produced from the feeding of high-starch diets and low amounts of fibrous feeds by producing more saliva, which contains a buffer and acts to protect the mucosal lining of the stomach from gastric ulceration. It also simulates to some extent the initial stages of eating. If left for long periods of time with nothing to eat, cribbing would make perfect sense to a horse that was hungry and trying to simulate grazing. It has been shown that horses with plenty of forage to nibble on at all times exhibit a lower incidence of cribbing than those with limited access to forage.

Weaning causes stress

Inability to graze also is implicated as a causative factor in the initiation of cribbing in weanlings. In the fall issue of *Trainer,* Mark Kennedy B.Sc., Ph.D., senior lecturer in animal welfare at Anglia Ruskin University in Cambridge, England, cited a 2002 study by Professor A. J. Walters and his colleagues at the University of Bristol in England that states: "Thoroughbred horses after weaning were found to be associated with a four-fold increase in the rate of developing crib-biting. Interestingly, the same study demonstrates that weaning young horses by confining them in barns or loose boxes rather than in paddocks with other horses was associated with an increased rate of development of abnormal behaviors, including stereotypes, and housing in barns rather than at grass after weaning resulted in further increase in the development of these behaviors."

This statement validates the concept of acclimating young horses to stalls so they are comfortable in them, but also leaving them out as much as possible. As training intensifies, stall time should be increased proportionally, but some turnout should be afforded on a daily basis as the best defense against the development of stereotypic behaviors.

Anti-cribbing devices should be used judiciously. All these devices simply mask the problem, create more stress for the horse, and ultimately do not change the outcome.

Research has shown that plasma cortisol levels rise in horses when cribbing straps are put on, and this stress increases when the straps are pulled so tightly that the horse cannot breathe and swallow normally. Altering the management protocol of the horse so as to better accommodate its needs and minimize anxiety is a better way to manage cribbing in horses.

Every horse deserves to live in a safe, comfortable, and low-stress environment. As their caretakers, it is the owners' responsibility to ensure everything possible is done to keep all horses happy, well fed, and trained. In return, they repay us with the thrill of breeding, owning, and successfully racing these remarkable animals.

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