

The Healthy Horse
Stress, Performance, and Adaptogenic Herbs

Christine King BVSc, MACVSc, MVetClinStud

This month's article is primarily for those with performance horses who are, or will be, competing frequently or traveling extensively this season. Athletic training and competition are hard on a horse, as are long-distance transport and the typical show environment (lots of strange horses and people, lots of noise and activity day and night, etc.). So many of the things we do to performance horses are antithetical to the horse's nature and natural lifestyle.

The fact that many horses adjust and seem able to cope with the physical and psychological stresses of training and showing is a great testament to the adaptability of this species. However, many horses never fully adjust, and they spend the entire show season in a state of chronic, low-grade stress.

The problem is that the signs of stress in a horse can be subtle, so they are often overlooked, disregarded, or misinterpreted as a training or behavioral problem. Over the course of the show season, the horse's performance and health decline if the various sources of stress are not identified and addressed.

Sources of Stress

The performance horse has many possible sources of physical and psychological stress to contend with, including these:

- intense or prolonged exercise (whether in training or competition)
- adverse environmental conditions, particularly high heat and humidity, but also dust and very cold or windy weather
- long-distance transport to and from shows (i.e. trips lasting longer than 6–8 hours)
- insufficient rest between athletic events or after long-distance transport
- lack of sleep at shows (e.g. late night events or activity in the boarding barn, stall too small for the horse to lie down and rest comfortably)
- new experiences during training or competition
- confinement
- removal from familiar environment and social group
- changes in daily routine when traveling and at shows
- strange environment (e.g. boarding at shows)
- presence and activity of strange horses and people at shows
- increased stress levels in the handlers and rider

With repeated exposure, many horses become accustomed to most of these stressors, and these activities or situations cease to be a significant source of stress. However, it takes only one new or worrisome thing to stress a horse. And, as mentioned earlier, some horses never quite adjust to all the extra stimulation associated with training, showing,

and traveling. (The sensitive horses I discussed in *Do Horses Get Fibromyalgia?* typically are the ones who are least tolerant of this extra stimulation and who never quite adapt to the rigors of competition. The same goes for sensitive people.)

The Stress Response

Regardless of the source of stress, the response by the horse's (or the person's) body is the same. The stress response is a physiological, protective response to an event that poses a threat (whether real or perceived) to the horse's well-being. Physiologists describe this response as readying the body for "fight or flight," although that phrase implies a rather dramatic and immediate reaction to imminent danger. In less extreme circumstances, the stress response is more subtle in its effects.

One of the key events in the stress response is the release of cortisol by the adrenal glands. Cortisol is a hormone with wide-ranging effects on tissues throughout the body. One effect, in particular, has important implications in athletic horses: cortisol decreases the movement of glucose from the bloodstream into muscle cells (and several other types of cells). This is meant to be a protective response, in that it conserves blood glucose for essential functions, such as brain activity. However, in an exercising horse it decreases the availability of this important energy source to the working muscles. As a result, athletic performance is lower than expected for the stage of training.

Chronic cortisol release (i.e. chronic stress) also suppresses immune function, impairs tissue healing, and causes a loss of muscle mass as amino acids from muscle proteins are used to produce glucose. Thus, chronically stressed horses lose their "bloom" and vitality; they look a little dull and they lack that spark which distinguishes winners from the "also ran"s.

In addition, chronically stressed horses are more susceptible to infections. That includes the contagious respiratory diseases (e.g. influenza, rhinopneumonitis ["rhino"], strangles) as well as shipping fever (bacterial pleuropneumonia as a consequence of long-distance transport). Recurrence of latent EPM (equine protozoal myeloencephalitis) or herpes virus infection also is more likely when a horse is chronically stressed. Furthermore, stressed horses are slower to recover from illness and from injuries (to which they, too, are more susceptible).

One other common effect of chronic stress is gastric ulceration (stomach ulcers). Gastric ulcer disease in horses is multifactorial. Stress (and the consequent cortisol release) is only one of several factors involved; however, it's a biggie. In survey studies of performance horses, gastric ulcers were found on endoscopic examination of the stomach in about 60% of show horses and over 80% of horses performing more intense athletic activities.

It's worth noting that in those studies only a small percentage of affected horses showed obvious physical or behavioral signs of having gastric ulcers. What this indicates is that a horse can be under sufficient stress to develop gastric ulcers without us being aware of it.

A study of cortisol levels in show jumpers illustrates this same point in a slightly different way. In this study blood cortisol levels in three groups of show jumpers—schooling level (least experienced), intermediate level, and open competition (most experienced)—were compared, both at the home farm and at a show. As you might expect, cortisol levels were higher in the schooling horses than in the more experienced

horses, and they were higher at a show than at the home farm. But even in the seasoned show jumpers, competition caused an increase in blood cortisol.

Indicators of stress in performance horses

Thus, chronic or repeated stress—whether physical, psychological, or both—has the potential to adversely affect a horse's performance in a variety of ways, including these:

- lower than expected performance at a single competition (see below)
- decline in performance either at an event lasting several days or over the entire season
- prolonged recovery following competition
- increased potential for injury
- prolonged healing following injury
- increased susceptibility to infections, and prolonged recovery following infection
- decreased appetite or "picky eater"; may precede or be associated with gastric ulceration
- weight loss or poor muscle development for the diet and training stage
- loss of "bloom" or vigor
- "souring" or developing a bad attitude to training and competition
- increase in the frequency or intensity of repetitive behaviors ("stable vices") at shows

Decreased performance may be manifested as lower than expected fitness for the level of training (e.g. slower times, earlier onset of fatigue, higher heart rates, slower recovery times). Or it may take the form of an increased incidence of errors in horses performing precise maneuvers (e.g. jumping, dressage).

Minimizing Stress and its Effects

There are several things we can do to minimize stress and its effects on health and performance in show horses. For the most part, it just takes common sense, good basic horse management, and a little sympathetic projection (i.e. if the situation stresses you, chances are it stresses your horse as well). Here are some of the most important management strategies:

- feed lots of good quality hay—for most horses, having hay available at all times (except during transport) is the best approach
- limit travel to 8 hours per day—for longer trips, it is wise to stop after 8 hours, unload the horse, and allow the horse to eat, drink, and rest overnight before continuing on your way
- allow plenty of rest between athletic activities and after long-distance transport
- provide as much peace and quiet as you can create in the show environment—it is particularly important that the horse feels safe enough and has room enough to lie down and sleep at night (bed the stall deeply, turn off all possible lights at night, avoid disturbing the horse at night)
- try to maintain consistency—in particular, maintain a familiar diet, daily routine (especially with regard to feeding), handlers, and (if possible) company

- allow plenty of down time at home between competitions; allow as much pasture turnout as possible during this time
- avoid overworking the horse—e.g. once she is ready for competition, rely on her training and memory, and simply maintain her fitness and flexibility with regular task-appropriate exercise, rather than relentlessly schooling her over jumps, doing the same dressage test over and over, etc.
- take good care of yourself (good food, plenty of rest) and pay attention to your own stress levels

And even with all of the above, adaptogenic herbs can be a wonderful addition to the nutritional program in horses who travel and compete often.

Adaptogenic Herbs

Adaptogenic herbs are plants that contain substances which improve the body's ability to handle stress and resist disease. In other words, adaptogens enhance the body's adaptive response to a wide variety of stressful events.

Adaptogenic herbs have been used in humans and animals for centuries in Asia. Over the past 50 years, they have been extensively studied by scientists in Europe, particularly in the field of exercise physiology. In fact, adaptogenic herbs are among the most studied plant substances that are used for nutritional or medicinal purposes. Over 1000 scientific studies have been published on the biological effects of *Eleutherococcus* (Siberian ginseng) alone. Extensive scientific study and centuries of empirical use indicate that adaptogenic herbs are very safe, with minimal side effects noted even in studies using high dose rates.

Several different plants have been found to have adaptogenic properties. The following herbs are among the most studied and most potent adaptogens:

- *Eleutherococcus senticosus* (Siberian ginseng)
- *Rhodiola rosea* (golden root or rose root)
- *Schizandra chinensis* (Chinese magnolia vine)
- *Echinopanax elatus* (Asian devil's club)
- *Aralia* species, including *A. mandshurica* (Manchurian aralia)

General properties of adaptogens

The specific effects on the body differ somewhat with each herb, but most adaptogens share the following properties:

- stimulate the immune system (in particular, they increase the number and potency of white blood cells)
- act as antioxidants
- delay the onset of fatigue during exercise
- have a protective effect on the heart muscle
- improve the sense of well-being
- lower or stabilize blood glucose levels (an insulin-like effect)

- optimize glucose utilization by various tissues, including muscle
- optimize lipid metabolism (utilization of fats for energy production)

Other specific properties vary with the herb. For example:

Eleutherococcus senticosus moderates the stress response, increases resistance to heat stress, stimulates bile production (which enhances digestion and absorption of dietary fats), and has some anti-inflammatory and antibacterial activity.

Rhodiola rosea stimulates a moderate increase in beta-endorphin levels (which may be how it improves the sense of well-being), increases attention span, decreases mental fatigue and situational anxiety, and decreases the release of adrenaline (another of the stress hormones) during stress. (By the way, I've tried *Rhodiola* myself when stressed, and I can attest to its beneficial effects!)

Schizandra chinensis helps protect the liver from viral and chemical injury, has some beneficial effects on digestion and healing of gastric ulcers, and has some anabolic (tissue-building) activity.

Aralia is a particularly cool one. In addition to being a potent adaptogen and antioxidant, it helps protect against gastric ulceration and helps the body heal existing ulcers. In one study using rats, *Aralia* extract was as effective as cimetidine (Tagamet®) in resolving gastric ulceration.

Adaptogens and the performance horse

Although these herbs have been widely studied in other species, very little research has yet been done on their specific effects in horses. However, practical use in performance horses and in horses with various medical problems has demonstrated that the beneficial effects noted in other species also apply to horses.

In particular, these herbs can help the performance horse in the following ways:

1. By supporting optimal immune function, they aid in resistance to infection and recovery following illness or injury.
2. By supporting optimal glucose and fat metabolism, they aid in the delivery and efficient use of these fuels in the working muscles; these effects allow the horse to perform at his natural best and maintain his lean muscle mass throughout the competition season.
3. By moderating the stress response, they help protect against gastric ulceration; some of these herbs also aid in the healing of existing gastric ulcers.

Studies into the effects of adaptogens on exercise capacity in other species have produced conflicting results. Some studies showed a positive effect on exercise capacity; others showed no effect. An effect is most likely in untrained (i.e. unfit) subjects, and is most consistently seen as an increase in endurance (i.e. a delay in the onset of fatigue). Most studies in *fit* human athletes show *no effect on performance*. So far, practical use in performance horses supports a similar conclusion: that adaptogenic herbs should not be considered "performance-enhancing" substances, but rather nutritional supplements which simply support optimal health and function.

Using adaptogenic herbs in horses

Most, if not all, of these herbs are readily available through herbalists and at some health food and natural grocery stores. The simplest way of getting them into your horse, though, is to feed a product called APF by Auburn Laboratories (www.auburnlabs.com). [Seldom will I recommend specific products in this column. I mention this one here for several reasons: (1) I really believe in it; (2) I'm impressed by the care this company have taken in the research, development, and quality control of this product, and by their commitment to clinical research and to ongoing research and development of adaptogens for use in horses, and (3) it is unique in an overfat market of nutritional and herbal supplements for horses.]

APF was developed by an equine veterinarian for use in performance horses. It contains the first four adaptogenic herbs listed above, in tincture (alcohol-based) form. The liquid is easily dispensed for daily dosing, as it comes in a dropper bottle with measures on the dropper and dosing recommendations on the bottle. When mixed with the horse's feed, most horses readily eat it, so daily use of this product is quick and easy, especially when you're traveling or at shows.

Regardless of the form in which you administer adaptogenic herbs (individual herbs or a blend such as APF), the best approach is to begin feeding the herbs during training, although it's fine to begin their use any time during the show season. You may find, though, that a higher initial dose is needed in horses already under stress. In horses who train and compete for most of the year, you can economize by increasing or decreasing the dose along with the horse's competition or travel schedule. For example, the dose can be increased in the week before and during travel and competition, and decreased to a maintenance level at home.

None of these adaptogenic herbs nor APF itself is prohibited under USEF rules. This product also complies with the spirit of the much-more-stringent FEI rules, in that it does not alter the horse's performance. As with good nutrition, it simply helps the horse do his natural best and stay healthy throughout the competition season. However, if you want to err on the side of caution, discontinue administration of these herbs 1 week prior to an FEI event. (Check with the manufacturer for more specific information.)

By the way, if you're a rider or groom who is prone to "performance anxiety," insomnia, colds and flu, or other stress-related disorders when you travel or show, you may want to consider taking some adaptogenic herbs yourself. You can buy the individual herbs in capsule form from health food or natural grocery stores; and Auburn Labs offers an APF for humans as well as the one for horses.

And on that note, I'll wish you a safe and successful show season. Have fun out there!

Copyright ©2006 Christine King BVSc, MACVSc, MVetClinStud

This article was first published in the January 2006 issue of Horses Inc. (www.horsesinc.net).