



Vol. 21, No. 3

July, August, September 2002

Enjoy Your Horse More in Summer

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Summer is in full swing and brings with it the greatest surge of horse activities. Owners are enjoying their horses on trail rides, at horse shows and assorted equine events. The various summer horse activities can challenge the horse owner with special problems.

In the Southeastern United States, high temperature and humidity can plague horse owners, especially if they are not prepared to deal with these issues.

Summer Horse Activities. Summer horse activities can vary from an occasional pleasure or trail ride to very intense performance at shows or events. Even the horse that spends most of its summer on pasture can have special needs, noted later.

The nutritional requirements of performance horses are defined as light, moderate and intense performance and are based on the maintenance nutritional requirements of a horse.

Maintenance is when there is no gain or loss in weight and when there is no performance. Mature pleasure horses on pasture, or even stalled, fit into this category. Many horses on good-quality pasture, if ridden occasionally and sparingly, will maintain their weight.

Performance energy requirements are noted in Table I. There is only a 25 percent increase in the energy (Mcal) needs for light performance above the maintenance requirement. Many owners think that their horses are at a higher level of performance, thus nutritional need, than they actually are. More horses likely perform at a light performance level than at the moderate or intense levels. Light performance is defined as English or Western pleasure, bridle path hack and equitation classes. In other words, most horse show rail classes are light performance. Horses ridden for pleasure or trail rides for several hours at low speeds also fit into this category.

Moderate performance is ranch or cattle work, cutting, barrel racing and jumping. Intense performance is racing, polo and three-day events. While this may be a debatable system, it at least gives one some idea of the performance intensity and the energy needs at each level of performance.

The intensity of performance, not the length of time, is critical in ascertaining the level of performance. A trail horse at a walk and an occasional trot for four hours spends less energy than a horse doing a moderate level of performance for several minutes.

Table I. Energy Needs of Performance

<i>Performance</i>	<i>Energy Above Maintenance, %</i>	<i>Energy 1,200 # Horse, Mcal</i>
Maintenance	0	17.8
Light Performance	25	22.2
Moderate Performance	50	26.7
Intense Performance	100	35.6

Best Preparation = Conditioned Horse. The best preparation a horse owner can have for summer activities, especially for moderate and intense performance, is a properly conditioned horse. Most pleasure horses ridden in light performance can be conditioned in about six weeks. (See: "Is Your Horse Ready for Spring?" Tennessee Horse Express. 21:2)

Heat and Humidity. Weather is often the major problem that horses, and their owners, face in summer. High temperature and humidity can be serious stress factors, limiting or even preventing performance.

When horses perform, chemical reactions necessary to create body movement produce internal heat. This heat must be eliminated to keep the body at an acceptable temperature level. To eliminate body heat, the body actually produces more heat. The horse is in a Catch 22 situation.

Blood pumped to the skin loses heat to the cool air. In summer, the air is hot and often humid. The horse cannot lose enough heat with this method, so it begins to sweat. Evaporation of sweat cools the body. In high humidity, enough sweat may not evaporate to cool the horse. Heat exhaustion can occur.

A practical tool for horse owners is the Heat Index. The Heat Index is the actual temperature in Fahrenheit plus the relative humidity in percent.

Heat Index = Temperature (F) + Relative Humidity

For example, a temperature of 90 degrees F and 60 percent humidity equals a Heat Index of 150.

When the Heat Index is less than 130, it is safe to perform your horse. However, if the Heat Index is 150 or more, you should use caution in riding a horse because evaporative cooling (sweating) is compromised. At a Heat Index of 180 or more, you *should not* ride.

In areas where temperature and relative humidity tend to be high, you should ride early in the morning or late in the evening when it is cooler and less humid. If the temperature is very high, the relative humidity does not have to be too intense before the Heat Index moves into the cautionary range. You may want to transport horses when it is cooler, even at night.

Many horse events are in direct sun. Unconditioned horses are more prone to heat stress-related problems. The properly conditioned horse is better prepared to dissipate or eliminate the internal body heat produced during moderate to intense performance.

Heat Stress. Numerous situations can put a horse at risk in summer, such as exposure to direct sunlight at a temperature of 100 degrees F or higher; hot, poorly ventilated stalls or trailers; overexertion during hot, humid conditions; and inadequate water intake. Non-fit, un-acclimated and over-exerted horses are more likely to succumb to heat stress.

Heat exhaustion results in weakness, rapid breathing, muscular tremors, heavy sweating, an elevated pulse of 50-100 beats per minute, a body temperature of 105-108 degrees F, increased capillary refill time and collapse.

Heat strokes are more severe. Breathing is more rapid, even greater than 200 breaths per minute, and the body temperature can reach 110 degrees F. Death can occur when a horse stops sweating.

Body Condition. A helpful tool for the horse owner is body condition score (BCS). BCS is a visual, hands-on method to determine the body condition (body fat) of the horse. A score of 1 is an emaciated horse; a score of 9 is an obese one. The system was initially developed for use in breeding mares; however, it has application with performance horses as well.

Pleasure horses doing light performance can have a higher BCS range, up to about 7.5 if ridden only occasionally. Moderate-performance horses can range from 5.5 to 6.5, while intense-performance horses need to be between 5 to 5.5. Some horses will perform well outside these ranges due to their genetic potential, physical conditioning and training. High and low BCS rankings can impede performance. The environment can also affect how well a horse performs. In hot, humid conditions, a horse with a higher BCS may not perform as well as in a cooler, less humid environment.

Fatter horses doing a set routine are more stressed than horses in moderate body condition. Fat horses have more difficulty getting rid of body heat that develops during performance. They also do not recover or cool out as quickly as less fat horses. Fatter horses tend to eat more as they have a higher maintenance requirement; thus less of their feed can be converted to energy for performance.

Temperature and Humidity. To evaluate the effects of hot, humid weather on performance horses in the field, a group of physically fit, mature, hunter/jumper horses were fed a typical hay (alfalfa/timothy) and grain ration. They were stabled but turned-out for an hour of exercise daily. The horses were conditioned to compete in the prevailing climatic conditions of July and in mid-September. They were first tested at a temperature of 88 degrees F and a humidity of 67% and later tested at 64 degrees F and a humidity of 47%. The horses were at the same level of physical fitness in both exercise periods.

Heart rates, respiratory rates and rectal temperatures were higher when the horses performed in the hotter, more humid environment than when it was cooler and drier. These data from Virginia Polytechnic University proved that high temperature and humidity are a thermal burden on performance horses.

Temperature Acclimation. Horses can be acclimated to perform at higher temperatures and humidity. Texas A&M University placed similarly conditioned horses either in a natural temperature/humidity environment or in a controlled environment at a lower temperature and humidity. After 28 days in these environments, the horses performed in the natural environment. Horses housed in a controlled (cooler) environment did not perform as well. After the initial performance, all horses were housed in the natural environment and performed again in two and five days. After five days, the horses originally kept in a controlled environment performed as well as those kept in the natural environment during the entire study.

This research indicates that horses need about five days to acclimate to a hotter and more humid environment. Horses should be housed and trained in the type of conditions in which they will perform. This is probably more critical for moderate and intense performance levels than light performance.

Warm Up Horses. As with human athletes, it is beneficial for performance horses to be properly warmed up. Research has shown that warming up horses before performance resulted in more plasma free-fatty acids and less lactic acids. Free-fatty acids are used as an energy source. Lactic acid is produced during anaerobic metabolism, energy production in the absence of oxygen. Warming up horses improved oxygen availability and decreased the need for anaerobic metabolism.

Another advantage of warming up is that it aids in eliminating the heat produced during performance. Horses warmed up before performance did not fatigue as quickly, required less oxygen to perform a high-intensity task, produced less heat and got rid of the body heat sooner, especially by sweating. A mild warm-up gave the best results in this study from South Africa.

Owners should not over-exert horses in warm-up periods prior to performance. Too long and too intense a warm-up period can be counterproductive, with the horse not being able to perform successfully.

A mild warm-up is adequate to activate the thermo-regulatory mechanisms of the horse, allowing it to get rid of body heat easier and sooner. Performance in these warmed-up horses was less strenuous and more efficient. Warming up probably places a horse's cardiorespiratory system in a state of readiness so it increases the cardiac output more quickly to accommodate the demand for increased blood circulation to cool the body.

Active Cooling of Horses in Summer. As noted, horses produce considerable body heat during performance. The hotter the temperature, the higher the humidity and more intense the performance, the hotter the horse and longer the cooling-out process.

Horses are normally hand-walked until cooled-out. An experienced horse person feels the horse's chest to determine when the horse has returned to a normal condition.

An aid to cooling-out horses is the application of cool water to their necks, shoulders, undersides and legs. What about cooling the horse by repeatedly washing its body with cold water after performing in a hot, humid environment? Of concern with this process is the potential negative effect on the horse, primarily its muscle metabolism.

Physically fit Thoroughbred mares were exercised on a high-speed treadmill at 88 degrees F and 78 percent relative humidity until their pulmonary artery temperature reached 106.7 C. They stood on the treadmill after exercise for a 30-minute recovery period. Horses were either passively-cooled (no water) or actively-cooled with tap water from a hose sprayed over their entire body, except their head.

Active cooling of horses exercised in a hot, humid environment resulted in a more rapid decrease in heart rate, pulmonary artery, rectal and muscle temperatures than passively cooled horses. Active cooling did not cause any physically damaging or negative biochemical effects.

Horses performing in hot, humid conditions can be cooled-out by applying cold (tap) water to their entire body (except the head) for about 30 minutes after exercise.

Feeding Concerns in the Summer. As performance increases, the need for more energy also increases. To meet this energy need, more total feed is normally fed, especially grain. This can be counterproductive. More feed equals more heat produced in digestion, so the horse has more heat to get rid of.

The heat increment (HI) of fibrous feeds can be 33 percent of metabolizable energy, while the HI of grains and fat is only 20 percent. Hay is a high-fiber feed that produces more body heat.

It is normally advisable to feed no less than one pound of hay per 100 pounds of body weight. In summer, select a high-quality hay with lots of fine leaves and stems that is soft to the touch. Early-cut hays have these characteristics and produce less HI than later-cut, more-mature hays. A high-quality grass hay is probably better than legume hays for most performance horses in summer.

Beet pulp or soybean hulls can replace part of a performance horse's hay. Beet pulp and soybean hulls are highly fermentable sources of fiber (thus energy) with a lower dry matter content than hays. They result in less HI.

Do not feed excess protein in summer either. High-protein rations also produce more HI. Mature horses require

less than a 10 percent protein ration. Feeding 12-14 percent protein only heats up the horse, requires more water intake and costs money.

Replacing part of the oats with corn produces a cooler ration. Corn is low in fiber and produces less HI than high-fiber oats. Corn should be limited to 3-3.5 pounds daily. Processed corn, such as coarse-cracked, steamed flaked or rolled, is better than whole-shell corn.

One of the best methods to produce a cooler summer ration is to feed fat. Fat has 2.25 times more energy than carbohydrates, so there is less HI from fats. Horses fed fat-added rations also eat less feed, which also results in less HI.

You can add about 6-8 percent of fat to the grain ration, resulting in a more energy-dense feed and a cooler ration. Feed-grade corn oil is easy to mix into a concentrate feed. Where only a small amount of fat is needed, add ½ to 1 cup corn oil to the grain. It takes about 21 days for horses to adapt to a fat-added ration.

It is also important when a performance horse is fed. Feed horses 3-4 hours before riding or exercising. Wait at least two hours after they have been ridden to feed grain. This procedure aids in digestion of feeds and insures horses are not ridden when their body temperature is high.

Pasture Horse in Summer. Horses on pasture in summer can often be neglected. They should be observed at least three times weekly if not daily. They need adequate shade; clean, fresh water; and trace mineralized salt in addition to quality pasture forage. Dry summer periods can dictate the feeding of hay and/or grain to supplement depleted pastures.

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Tennessee Horse Express

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E12-4415-00-003-03

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