

# MATURE, SENIOR AND GERIATRIC HORSES: MANAGEMENT, CARE AND USE

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## INTRODUCTION

A 15-year-old horse once was considered “old,” but with improved methods of management, care and conditioning, horses well past that age can continue to thrive. Such horses remain in full service, being ridden in a variety of work, leisure or competitive activities that require adequate nutrients, health care and fitness conditioning. Many older mares also are active members of broodmare bands, annually producing foals and rebreeding for the following year.

Texas is home to just over 1 million horses, the majority of them working horses, competitive event horses and pleasure/recreational riding horses.<sup>1</sup> For owners of horses that have completed their growth, knowing how to take care of their older horses can mean the difference between horses that just survive or animals that thrive.

## CLASSIFYING/IDENTIFYING HORSES AT LATER LIFE STAGES

The terms mature, senior and geriatric commonly are used to describe horses that have completed their growth; many owners want to know when their horse move from one classification to another. However, aging is a continuous process, so there’s no discrete movement between these classes. Rather, such classifications may be used solely for purposes of illustration and discussion.

### Mature Horses

Many breed associations categorize riding horses in the 2- to 5-year-old range as junior horses.<sup>2</sup> Research

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Performance horses should be lean, but not thin, in body condition of 5 to 5-1/2.

has documented continued growth in 4- and 5-year-old horses, although such growth is comparatively small compared to earlier rates.<sup>3</sup> Both scientific and industry consensus is that by the end of the fifth year, a horse can be considered mature. Such 5-year-old horses are said to be “full-mouthed,” meaning that their baby teeth are gone and all permanent incisors have erupted.<sup>4</sup> By age 11, a horse is referred to as a “smooth-mouthed” horse because the cups in the teeth are no longer visible.

### Senior Horses

Assignment of a horse to this classification varies, depending on whether the category refers to performance eligibility in an association or to terminology developed by horse-feed manufacturers. Most competitive horses 6 years old and older are considered senior horses, yet feeds developed for senior horses typically are intended for much older animals that experience changes in normal eating behavior.

Evaluation of eating behaviors in an otherwise healthy horse provides a simple way to determine the horse’s status as mature or senior. In particular, as a horse reaches 15 years of age, an owner should examine its

behavior when it is eating hay or grazing grass. Most older horses start “quidding,” spitting out partially chewed mouthfuls of hay or grass<sup>5</sup>, reflecting the changing status of their teeth. The age at which this occurs varies greatly.

## Geriatric Horses

Although geriatric horses cannot be defined by a particular age, 70 percent of horses 20 years old or older are found to have some condition requiring special care<sup>6</sup> and/or management significantly different from that needed by a mature or a senior horse. (Some breed associations automatically record a 25-year-old horse as “deceased,” unless notified otherwise by its owner.) As they reach geriatric status, horses vary in their abilities to perform athletically, to eat or even to accomplish routine activities such as lying down, getting up or bending around to scratch an itch. Even so, some horses 25 years old or older still are being ridden, may remain on conventional feeding programs and have minimal-to-no special problems.

Many times, the aging process that pushes a horse into geriatric status has been hastened by an injury. Chronically foundered horses, severely arthritic horses and those with special conditions of the kidneys, liver or other organs may be classed as geriatric (see Table 2). Special conditions of geriatric horses may make it necessary to avoid using certain feeds.

New types of horse feeds and advanced healthcare practices have focused on older horses. “Complete senior feeds” and “equine dentistry” have become common terminology for owners of older horses.

## THE HORSE’S MOUTH — EQUINE DENTISTRY

At least once a year, every horse’s mouth should be examined by an equine practitioner or a qualified equine dentist, who will initiate needed corrective procedures. Such dental exams should start before the horse first begins training.

A horse exhibiting changes in grazing or in hay consumption may be having difficulty biting and chewing such roughage; there also may be changes in overall digestion and synthesis functions in the large intestine. Dental problems that may particularly plague older horses include:

- ▶ Bit problems – During dental exams, owners routinely may be asked about older horses’ responses to bit placement and bit pressure while being ridden. Such problems may be related to the “bit seat,” the area where the mouthpiece actually rests, or to the presence of “wolf teeth” needing removal.

- ▶ Missing, loose or sharp-edged incisors or molars<sup>7</sup> Whatever their position, loose teeth may need to be extracted. Missing incisors (due to cribbing or to traumatic injury) may spell difficulty eating for some horses, although others get along just fine without them. Molar problems may be signaled by horses holding their heads sideways while chewing and/or dribbling feed while eating. Because a horse’s upper jaw is wider than its lower jaw, years of chewing may cause sharp enamel points to develop on the outside edges of the upper molars and on the inside edges of the lower ones. Such sharp points cause a horse to dribble feed. “Floating” with high-tech electronic devices that target only affected teeth can remove these sharp edges, but aggressive floating may risk loosening the teeth being treated. Equine dental practitioners may cautiously float teeth of older horses as needed, then encourage owners to monitor their horses’ eating behavior for signs of continued difficulty.

## NUTRITION AND FEEDING

Each horse owner must decide when to change from traditional pellet or textured (sweet) feeds to those designed specifically for “old” horses. Key factors in this decision are the horse’s physical ability to consume and chew roughage and its nutrient needs as influenced by likely changes in function of its large intestine.

## Manufactured Senior Feeds

Although little research exists on the nutrient requirements of older horses, one study found that compared to younger horses, horses aged 20 years and



Chronic cribbers often need a specially designed strap/collar, and should be fed and watered low to the ground.

older had lower apparent digestion of protein, fiber and some minerals.<sup>8</sup> Consequently, manufacturers have developed “complete” feeds, many of them classified as “senior” feeds. Almost every major feed company manufactures such a feed (see Table 1).

**Table 1. Typical nutrient content of some senior-type feeds for old horses.**

|                       |                   |
|-----------------------|-------------------|
| Crude protein         | 12-14%            |
| Crude fat             | Not less than 5%  |
| Crude fiber           | Not less than 16% |
| Lysine                | 0.6–0.7%          |
| Calcium               | 0.6-1.2%          |
| Phosphorus            | 0.4-0.8%          |
| Magnesium             | 0.15-0.30%        |
| Sulfur                | 0.15-0.30%        |
| Copper                | 26-55 ppm         |
| Zinc                  | 100-220 ppm       |
| Vitamin A             | 1500-3000 IUs/lb  |
| Vitamin E             | 40-80 IUs/lb      |
| Biotin                | 0.4-0.5 mg/lb     |
| Vitamin B1 (Thiamine) | 2.2-2.6 mg/lb     |

Complete senior feeds are designed to help a horse eat, so they often are extruded or otherwise produced as soft, easy-to-chew pellets; processing sometimes involves heat treatment to gelatinize starches, making them more easily digested and absorbed in the small intestine. However, senior feeds will not effectively put additional weight on horses that have no eating problems because, compared to many other feeds, they contain too much fiber and too few calories. In one study, a specially designed feed, containing about 1300 kilocalories of digestible energy per pound, improved body-condition scores and weight gain more significantly than a traditional sweet feed, but differences were greatest in old, very thin horses.<sup>9</sup>

Complete senior feeds routinely contain energy from carbohydrates and fats, with limited energy from fiber, and typically contain enough fiber so a horse does not have to eat hay or graze to maintain its digestive tract integrity. Even so, most horse owners using complete feeds also continue to offer their horses hay or grazing; such a practice helps keep a horse living as normal a life as possible for as long as possible. These feeds focus on protein quality from sources like soybean meal, known for supplying essential amino acids (lysine, threonine,



Lena’s Measles, a 24-year-old gelding shown by Mary Beth Sigler, demonstrates the utility and athletic ability still present in many senior-aged horses because of how they are conditioned and fed. Photo courtesy of Dennis Sigler and Littlefield Photography.

methionine); on suspected needs for additional vitamins (for example, B complex) no longer synthesized in adequate amounts in the hindgut; and on carefully formulated concentrations of minerals.

## Owner-Mixed Feeds

Some horse owners mix their own feeds, using various combinations of oats; cracked, rolled or steam-flaked corn; barley; soybean meal; wheat midds; and dehydrated alfalfa. If you chose to mix your horse’s feed, seriously consider:

1. Total nutrient balance
  - a. Pay particular attention to mineral concentrations and to the ratio of minerals to each other and to total energy. Whether fed individually or mixed together, single grains have an inverted calcium-to-phosphorous ratio, so calcium sources such as dicalcium phosphate and calcium carbonate need to be included in appropriate amounts to achieve the proper balance.
  - b. Include appropriate amounts of trace minerals (sodium, potassium, chloride) to maintain dietary electrolyte balance (cation/anion balance or DCAB), important for sweating horses and for calcium deposition to minimize osteoporosis-type weakening of the skeletal system.<sup>10</sup>
2. Vitamin A, D and E requirements of horses (not cattle)
  - a. Vitamin A is often added at 1500-2000 IUs/lb.
  - b. Vitamin D should never be added at more than 1/10th the level of Vitamin A.

- c. Vitamin E's antioxidant role is important for hard-working horses; it usually should be added at 50 to 60 IUs/lb.

### 3. Presence of fumonisin

- a. Horse owners who mix their own feed should be concerned about fumonisin, which can cause leukoencephalomalacia in horses. Recently fumonisin has been detected in corn grain at a much higher rate of incidence than in the past few years. Corn screenings or corn by-products should never be included in feeds because fumonisin can be highly concentrated in them. The Texas State Chemist's Office, the Texas Veterinary Medical Diagnostic Lab and the Equine Science Section in the Department of Animal Science (all at Texas A&M University) have worked together to notify feed manufacturers about dangerous fumonisin levels and about testing procedures needed for all corn.

## Advantages of Commercially Manufactured Senior Feeds

In many cases, well-balanced horse feeds from reputable companies are hard to beat. For example, many companies manufacture "oats balancers" to correct mineral imbalances and provide suitable protein. Although care must be exercised when supplementing B-vitamins, older horses often benefit from senior feeds because they provide vitamins these horses no longer synthesize in sufficient amounts.

Manufactured horse feeds also do not contain additives or feedstuffs that can harm or kill horses. For example,



Once considered old, horses such as 15-year-old Step By Te, shown by Tyler Gibbs, are actually in their prime, thanks to good management and care. *Photo courtesy of Tyler Gibbs.*

most horse owners know about dangers to horses from remensin and bovatec. Also, although horses can tolerate urea as well as cattle do, urea provides no nutritional benefits and should be avoided.

## BODY CONDITIONING SCORING — WEIGHT GAIN/LOSS

### Evaluating Body Condition

The eye of the horseman or the horsewoman is important in evaluating a horse's body condition, whether the owner is concerned about putting weight on a horse, getting it in shape, or enhancing a horse's thermal regulation. Significant loss in body condition is one of the worst things that can happen to an old horse, but such loss is fairly common.<sup>6,9</sup> An old arthritic horse or a chronically foundered one does not need to carry extra weight, but with rare exceptions, thinness needs to be avoided in old horses. Older horses are notorious for having difficulty gaining weight. The owner's challenge and goal is never to let an older horse get thin in the first place.

The Equine Sciences Program in the Department of Animal Science at Texas A&M University has developed a body-scoring system.<sup>11</sup> Numerous research projects have evaluated influence of body condition on performance in broodmares and in riding horses. Maintain riding horses at body condition scores between 5 and 6. For riding horses with scores of 5, ribs cannot be seen but are easily felt; such horses' backbones or toplines basically are level. When riding horses get beyond scores of 6 and approach being considered fat, they have more difficulty with heat production.<sup>12</sup> However, an older, thin riding horse will fatigue more quickly because it does not have energy needed to work. Yet, if such horses are allowed to get too fat, summer months are hard on them. Old, thin horses not being ridden will have trouble staying warm in really cold winter weather. Try also to maintain stiff, arthritic and foundered horses at body scores between 5 and 5-1/2.

Texas is home to some of the best broodmares in the country, but many owners worry about their mares 15 years old and older. Research including groups of older mares has focused on conception and foaling rates, in which body condition plays a significant role regardless of age.<sup>13</sup> Contrary to popular belief, fat mares have not experienced foaling problems (dystocia).<sup>14</sup> A group of older mares with no breeding-problem history should have conception rates of 95 percent or higher, provided they are in good body condition.

For old, thin milking mares—those that are ribby or have some backbone sticking up with the tail-head exposed – rebreeding rates will be low, often around 35 percent. Thin mares are notorious for skipping a breeding season simply because they lack the nutrient stores and nutrient supply to produce milk and support new pregnancies.<sup>15</sup> In one study, milking mares with body condition scores of less than 5 were checked pregnant at 45 days, but a 12 percent pregnancy loss occurred at some time after this 45th day.<sup>16</sup> Such pregnancy losses can be avoided if old mares come into breeding season at body condition scores of 6 or 7.



Broodmares should be fat, but not obese in body condition of 6-1/2 to 7.

Mares should not be overly fat or obese (scores of 8 or 9), but fat mares are desirable. So, if a mare set to foal in March is thin in January, take a careful, consistent approach to improving her body condition. Such improvement is easier to accomplish before foaling than after a foal hits the ground.

## Feeding to Influence Body Weight

For too-thin older horses with no apparent chewing or eating-behavior problems, owners should use a reasonable daily amount of feed to attempt to increase body weight. Such horses should be fed two to three times per day at equal intervals, receiving feed equal to no more than 1/2 percent of the horse's desired body weight in grain per feeding (3/4 percent of body weight per feeding is the absolute maximum that should be fed). For example, a horse that ought to weigh 1100 pounds should receive about five pounds of feed at any one feeding (but never more than eight pounds per feeding). Horses with a history of founder or colic should never receive more than 1/2 percent of their desired body weight in feed per feeding.

To add weight to their horses without providing a greater amount of feed, owners should select an energy-dense feed with supplemental fat (for example, corn oil) added. For instance, 10 pounds of straight oats contain about 12,500 to 13,000 kilocalories of digestible energy. If this grain were supplemented with 1/2 pound of corn oil, the resulting 10-1/2 pounds of feed would contain 13,500 to 14,000 kilocalories of digestible energy. So, for riding horses and broodmares that need to gain weight, fat-supplemented feeds can be used to increase weight safely with reasonable amounts of daily feed, without increasing chances for colic or founder.<sup>17</sup>

Fat-supplemented feeds also will allow owners to feed less grain to their riding horses, resulting in less total carbohydrate load and less heat production for the horse to deal with. Fat-supplemented feeds routinely are recommended for riding horses being used hard in hot weather.<sup>18</sup> Along with daily hay intake monitored closely at no more than 1 percent of body weight, such feeds can help horses more efficiently regulate body temperature during hot summer months.

Many reputable companies manufacture horse feeds with supplemental fat sources. If you need such feeds and you feed grass hay as a roughage source, look for a 14 percent crude protein feed with a crude fat percentage in the 6 to 8 percent range. A feed with a crude fat listing of 7.5 to 8 percent usually has about 5 percent supplemental fat added to it.

Heavily-stressed horses often experience exercise-related inflammation in the ankles, knees and hocks. New research has involved feeding different sources of fat to hard-working, high-performance athletes to alter inflammatory responses. Reduced inflammation was observed when fat sources contained an optimum ratio of omega 6:omega 3 polyunsaturated fatty acids.<sup>19</sup> Although more research is needed, owners can expect to see changes in sources of supplemental fat for horse feeds.

## USE IT OR LOSE IT — FITNESS, EXERCISE AND CONDITIONING

### Avoiding Inactivity

Inactivity compromises skeletal strength in all horses, including older ones.<sup>20</sup> During periods of no work or exercise, horses maintain heart, lung and muscle fitness much longer than they maintain skeletal strength. As they move from senior to geriatric status, horses also will lose muscle mass; such loss is caused as much by lack of exercise as by increasing age.

Senior horses are like senior citizens when it comes to regular, controlled exercise. Stretching, movement and routine activity all help challenge muscles and skeleton. Exercise signals the bone to remodel to either maintain its current strength or become stronger. Some older riding horses may show signs of arthritis. Such horses should not be expected to be as flexible, long-strided, quick or durable as their younger counterparts. Routine, closely monitored exercise will help evaluate expectations for a particular horse and determine its potential for upcoming work.

All riding horses need a warm-up, but arthritic horses need a carefully controlled one consisting of walking, some bending and a little trotting, to increase temperature for muscle contraction and relaxation and to improve blood flow. This warm-up is the first step to reducing chances of soreness and injury.

For all riding horses (but especially for older ones), owners should plan ahead, paying close attention every day to exercise needs. Although it is convenient, quick and easy to jump on a four-wheeler to go to the mailbox or check a fence line, think of using your horses. A horse that will be needed to work cattle in a couple of months needs routine exercise now. Long-trotting a horse to the mailbox or saddling up to do something around your place is a good way to get a horse in shape and



Regular exercise helps keep older horses active and useful.

keep it fit. Such regular riding helps riders, too; adults have listed stress-reduction and relaxation associated with riding horses as quality-of-life reasons for horse ownership.

Don't expect a hard day's work if a horse hasn't been prepared for such work. You can't hurry fitness; it takes time, with regular evaluation for signs of soreness or stiffness. To build a horse's fitness level, use a strategy called specificity of training, giving the horse gradual and subtle increases in workload to mimic tasks it will be expected to accomplish. According to research on younger horses, introducing horses to hard work signals bones to begin a four-stage remodeling process. During the first 60 to 90 days of this process, bones actually weaken, but eventually will become stronger.<sup>21</sup> As bone remodeling progresses, continue riding your horse, but realize that it may be a couple of more months before it actually has a stronger skeletal system.

## Importance of Cool-Down

Performance horses' work bouts or competitions often leave them acutely fatigued.<sup>22</sup> Avoid the temptation to complete a workout and immediately tie up the horse to a fence or trailer; instead, cool it down. For instance, a horse used to pen and sort cattle may be hot and sweaty, with an elevated heart rate. Although you may want to dismount immediately and tie up the horse so you can move on to another task, take a few minutes to cool it down with a little trotting, followed by quite a bit of walking. The cool-down should last long enough to let the horse's respiration and heart rate return to a normal resting rate.

During cool-down, remember to let horses drink water. Give really hot horses only a small amount of water at first; they need water to replenish sweat loss and to maintain moisture-balance in their digestive systems. Although there may not be enough cool-down time to return a horse completely to a resting state, some cool-down movement makes a real difference in minimizing subsequent soreness, stiffness or even "tying-up syndrome."

Tying-up syndrome refers to a condition in which performance horses have hindered movement or inability to move at all. Less-complicated forms of tying-up often are referred to as azoturia, Monday-morning sickness or blackwater disease, occurring in horses used hard for several days, then given Sunday off, with tying-up symptoms appearing on Monday morning. More complicated forms of tying-up include polysaccharide storage myopathy or recurrent exertional rhabdomyolysis; their causes and treatments are complicated as well.<sup>23</sup> (See Table 2.)



Watch eating behavior as horses get older. Note: Do not leave halters on grazing horses.

Finishing a workout with a cool-down better ensures complete muscle contraction/relaxation because it helps blood rid muscles of waste products such as lactic acid and ammonia. Also, it is important to give riding horses free exercise on days they are not being saddled and used. On off-days, you also may want to decrease their grain intake somewhat.

## HOOF CARE

### Costs

For mature horses, hoof care is the third most expensive horse-keeping cost, just behind nutrition and emergency/preventative healthcare.<sup>1</sup> During one year, money spent on hoof care represents about 15 percent of the total cost to keep a mature performance horse. Hoof-care expense can be expected to increase for some senior horses, and for some geriatric horses, it could represent 25 to 50 percent of annual costs. While it may cost a little money to keep a horse's feet in good shape or to manage existing hoof conditions, for a horse with a job to do, whether riding horse or broodmare, hoof care expenses represent money well spent.

### Conditions and Care

Older riding horses often exhibit a variety of hoof conditions. Some are just naturally "good-footed horses," while others may have poor hoof walls or problems with the white line. Many older horses that have been in service for years show signs of navicular disease or evidence of founder.

Advances in hoof care contribute to keeping in service older horses that would otherwise be unable to move around. For horses with poor hoof-wall strength and integrity, consider supplemental biotin. Based on research conducted in Switzerland, long-term biotin supplementation (for 9 months or longer) may improve

hoof condition in about one-third of horses with hoof wall and white line problems.<sup>24</sup> However, most supplements on the market won't make nearly so much difference to hoof health as will routine hoof care, including proper and timely hoof trimming and shoeing.

## OTHER HEALTHCARE ISSUES

### Essential Vaccinations

Unfortunately, annual immunizations are easily forgotten. Nature, however, reminds horse owners of the need to vaccinate their animals, by means of emerging (new) infectious diseases like West Nile virus. Failure to keep horses on regular, annual immunization programs can result in a lost horse.

Consult a veterinarian who knows horses to find out what immunizations are absolutely necessary in your area. Most equine practitioners will recommend a basic vaccination program (including rabies vaccine), along with other immunizations based on the needs of individual horses. In many cases, they will recommend immunization against Venezuelan, eastern and western encephalitis and for tetanus (VEWT).

Since the emergence of West Nile virus, basic vaccination programs have been expanded to recommend immunization against this disease as well, with an initial injection followed by a second shot about 4 weeks later. West Nile vaccination must be continued in subsequent years, although spacing between boosters may vary from that of the first year of immunization.



Remember annual immunizations as part of routine preventative health care.

Talk to your veterinarian about vaccinations your horses need, and strongly consider vaccinating against respiratory diseases, particularly if horses are hauled to other locations throughout the year. Be sure to vaccinate for those “embarrassing diseases” (e.g., rabies and tetanus) that a horse owner ought to be able to avoid completely.

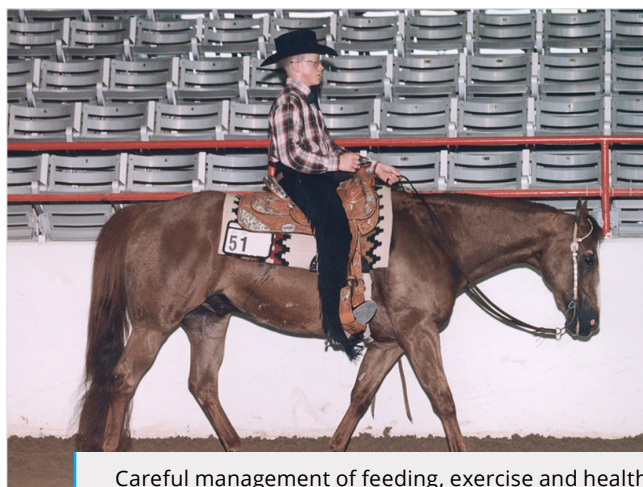
## De-Worming Your Horses

There are several ways to de-worm your horse; you need to match your chosen method to your particular situation. For example, a few horses grazing a large pasture should be evaluated differently from a few horses in semi-confinement on a few acres in close contact with each other. Select an appropriate de-worming strategy, then stay on schedule.

Broad-spectrum tube worming is effective, although this method is not utilized so much as in the past because of the advent of paste wormers and daily-feed wormers. Remember that just because you put a paste de-wormer in your horse’s mouth, that does mean the horse swallowed it. It’s especially important to watch the old, smart horses carefully, because they are notorious for holding paste in their mouths until you leave, then spitting it out onto the ground. Even if you choose a daily-feed de-wormer, start your program with one dose of a paste de-wormer.

## SPECIAL CONDITIONS AFFECTING OLDER HORSES

Consistent and careful management of still-active older horses translates into annual horse-keeping costs often ranging from \$1,900 to \$3,000 per horse per



Careful management of feeding, exercise and health care allow older horses such as Overdue Skip, a 22-year-old gelding shown by Tyler Gibbs, to continue being an active part of the horse industry. *Photo courtesy of Gibbs family and Jay Hardy Photography.*

year. Most horse owners agree that such costs are well worth it when service and quality-of-life contributions provided by such horses are considered. But sooner or later, regardless of careful management, the wear and tear of the years moves a horse from mature through senior into geriatric status. Many geriatric horses have been retired with no expectations of working and with full run of their owners’ places (such horses commonly are referred to as “yard art”). However, owners can expect some geriatric horses, because of special health problems, to be more expensive to maintain and manage than mature or senior horses.

Table 2 lists some of the special conditions affecting mature to geriatric horses and requiring specific management procedures. For instance, diet plays a role in management of horses with the gene for hyperkalemic periodic paralysis (HYPP).<sup>25</sup> Some mature horses, particularly those kept confined and fed concentrate feeds, have varying degrees of equine gastric ulcer syndrome (EGUS).<sup>26</sup> Again, diet and feeding management are important in the care of such horses. These two examples point to the fact that horses of all ages can have special conditions requiring adjustments in routine care.

Geriatric horses also may just get older and stiffer until one day they can’t get up without falling. Other geriatric horses are plagued with pituitary/thyroid malfunctions<sup>5</sup> or kidney/liver problems. Older horses’ systems also may undergo changes such as unseasonable hair growth. The lights in many horse barns are timed to give horses 16 hours of light and 8 hours of darkness, even in mid-winter. While this system is quite effective in keeping horses from growing a coat of winter hair, many geriatric horses will start growing unusually long hair in late August or early September, despite this artificial lighting program.

Special problems such as those listed require careful evaluation, and in many cases, geriatric horses with such conditions need to be kept from eating certain feedstuffs. Examples include:

- ▶ Do not feed legume hays such as alfalfa to horses with kidney or liver problems.<sup>5</sup>
- ▶ While fat-supplemented feeds benefit many older horses, do not feed them to horses with liver dysfunction.
- ▶ Do not feed wheat bran and beet pulp to horses with altered kidney function.<sup>5</sup>

Because it essentially is impossible to list here all potential health considerations, consult an equine nutritionist and an equine practitioner when dealing with horses with suspected or known systemic irregularities.



Table 2. Special conditions affecting some mature, senior and geriatric horses.<sup>5,6,23,26,27</sup>

| Condition                              | Consider                                                                                                                                                                                                                                                              | Avoid                                                                                                                                                                                                                                                                                                 |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Arthritis                              | <ul style="list-style-type: none"> <li>▶ Balanced diet with adequate minerals</li> <li>▶ Plenty of free exercise</li> <li>▶ Joint therapy*</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>▶ Excess body fat</li> <li>▶ Hard work without gradual warm up</li> <li>▶ Stalls without cushion</li> </ul>                                                                                                                                                    |
| Anhydrosis                             | <ul style="list-style-type: none"> <li>▶ Balanced diet with adequate minerals</li> <li>▶ Cooled environment: fans, ventilation, shade</li> </ul>                                                                                                                      | <ul style="list-style-type: none"> <li>▶ Hard work when not sweating</li> <li>▶ Paddocks with no shade</li> <li>▶ Hard work in the sun</li> </ul>                                                                                                                                                     |
| Colic-prone                            | <ul style="list-style-type: none"> <li>▶ Smaller meals at equal intervals</li> <li>▶ Adequate digestible fiber</li> <li>▶ Good quality chopped hay</li> <li>▶ Feed hay off the ground</li> <li>▶ Guaranteed fresh water</li> <li>▶ Increased free exercise</li> </ul> | <ul style="list-style-type: none"> <li>▶ Gain intake of more than 1/2% body weight per feeding</li> <li>▶ Sudden changes in type or amount of grain or hay</li> <li>▶ Combined changes in diet, exercise and stabling</li> <li>▶ Stemmy, coarse hay</li> <li>▶ Irregular feeding intervals</li> </ul> |
| Classic Cushings                       | <ul style="list-style-type: none"> <li>▶ Fat-supplemented feeds with highly digestible fiber source for weight gain or maintenance</li> <li>▶ Vitamin C supplements at 5-10 grams twice daily</li> </ul>                                                              | <ul style="list-style-type: none"> <li>▶ More than 1/2% body weight in grain at any one feeding</li> <li>▶ Extreme thinness, if possible</li> </ul>                                                                                                                                                   |
| Peripheral Cushings                    | <ul style="list-style-type: none"> <li>▶ Reduced starch and sugar intake</li> <li>▶ Careful introduction of some forced exercise, if possible</li> </ul>                                                                                                              | <ul style="list-style-type: none"> <li>▶ Continuing weight gain</li> <li>▶ Large meals</li> <li>▶ Conditions that might promote acute founder</li> </ul>                                                                                                                                              |
| Cribbing                               | <ul style="list-style-type: none"> <li>▶ Cribbing strap/collar</li> <li>▶ Lower feeders/waterers</li> <li>▶ Increased hay intake</li> </ul>                                                                                                                           | <ul style="list-style-type: none"> <li>▶ Elevated feeders</li> <li>▶ Restricted hay intake of less than 1% of body weight</li> </ul>                                                                                                                                                                  |
| Equine gastric ulcer syndrome (EGUS)   | <ul style="list-style-type: none"> <li>▶ 1-2 pounds alfalfa after a grain meal</li> <li>▶ Total daily feed in 3 or 4 meals per 25 hours vs. 2 meals per 25 hours</li> <li>▶ Plenty of free exercise with grazing, if possible</li> <li>▶ Gastrogard*</li> </ul>       | <ul style="list-style-type: none"> <li>▶ Large meals</li> <li>▶ Total stall confinement</li> <li>▶ Competition for feed</li> <li>▶ Sweet feeds with more than 3% molasses</li> </ul>                                                                                                                  |
| Founder                                | <ul style="list-style-type: none"> <li>▶ Energy feeds provided in small meals only</li> <li>▶ Fat-supplemented feeds</li> <li>▶ Special shoeing</li> <li>▶ Clean, dry hat</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>▶ Large meals of high-carbohydrate feeds</li> <li>▶ Group feeding</li> <li>▶ Exercise on rocky, uneven ground</li> <li>▶ Sudden introduction or extended access to lush pastures or rich hay</li> </ul>                                                        |
| Hypercelemic periodic paralysis (HYPP) | <ul style="list-style-type: none"> <li>▶ Concentrates and hays low in potassium</li> <li>▶ Acetazolamide*</li> </ul>                                                                                                                                                  | <ul style="list-style-type: none"> <li>▶ Molasses</li> <li>▶ Large amounts of alfalfa</li> <li>▶ Meals of grain exceeding 1/2% of body weight per feeding</li> </ul>                                                                                                                                  |

Table 2 (continued)

| Condition                                       | Consider                                                                                                                                                                                                                                                                                                                                            | Avoid                                                                                                                                                                          |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kidney dysfunction                              | <ul style="list-style-type: none"> <li>▶ 10% crude protein horse feeds</li> <li>▶ Clean, grass hay</li> <li>▶ Feeds with lower amounts of calcium and phosphorus</li> </ul>                                                                                                                                                                         | <ul style="list-style-type: none"> <li>▶ Beet pulp, alfalfa, clovers, wheat bran</li> <li>▶ 14-16% crude protein feeds</li> <li>▶ Mineral supplements</li> </ul>               |
| Liver disease                                   | <ul style="list-style-type: none"> <li>▶ Feeds containing corn and barley</li> <li>▶ Supplemental Vitamin C and B-complex vitamins</li> </ul>                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>▶ Soybean meal, wheat bran, alfalfa</li> <li>▶ High protein carbohydrates</li> </ul>                                                    |
| Navicular disease                               | <ul style="list-style-type: none"> <li>▶ Special shoeing</li> <li>▶ Maintenance of moderate body condition</li> <li>▶ Soft bedding</li> <li>▶ Joint therapy*</li> </ul>                                                                                                                                                                             | <ul style="list-style-type: none"> <li>▶ Excess body fat</li> <li>▶ Exercise of standing on hard surfaces</li> </ul>                                                           |
| Polysaccharide storage myopathy syndrome (PSSM) | <ul style="list-style-type: none"> <li>▶ Reduced carbohydrate intake with fat-supplemented feed</li> <li>▶ Alfalfa pellets with added vegetable oil or rice bran</li> <li>▶ Forage at 1-1/2 to 2% of body weight per day</li> <li>▶ Maximum free turn-out time</li> <li>▶ Gradually reintroduced, increased forced exercise, if possible</li> </ul> | <ul style="list-style-type: none"> <li>▶ Large amounts of grain per meal</li> <li>▶ Single grains low in Vitamin E</li> <li>▶ Random Vitamin E/selenium supplements</li> </ul> |
| Recurrent exertional rhabdomyolysis (RER)       | <ul style="list-style-type: none"> <li>▶ Energy provided via both fats and carbohydrates</li> <li>▶ Electrolyte supplement with a 2:1:4 ratio of sodium, potassium and chloride</li> <li>▶ Oral chromium: 5 mg/day</li> <li>▶ Dantrolene*</li> <li>▶ Phenytoin*</li> </ul>                                                                          | <ul style="list-style-type: none"> <li>▶ Excess stall confinement</li> <li>▶ Molasses</li> <li>▶ Restricted water intake</li> <li>▶ Feeds high in starch/sugar</li> </ul>      |
| Azoturia (Monday morning sickness)              | <ul style="list-style-type: none"> <li>▶ Reduced grain intake on unworked days</li> <li>▶ Ample turn-out area</li> </ul>                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>▶ Stall confinement</li> <li>▶ Hard work without prior conditioning</li> </ul>                                                          |

Note: Thyroid and pituitary problems, diabetes and Cushings may involve some degree of insulin sensitivity.

\* Consult an equine practitioner about products and treatment protocols.

## CONCLUSION: THE OLD AND MAINTAINED HORSE VS. THE OLD AND USEFUL HORSE

Some of today's old horses have retired after raising several children or helping ship thousands of head of cattle. Some owners feel that these horses don't owe anything to anyone. Even though they are livestock, their owners want to keep them around for sentimental reasons, making them as comfortable as possible. But owners should be realistic about what's possible and should consult knowledgeable professionals to help with decisions about geriatric horses with special

problems. Dealing with such horses will involve nutrition, veterinary medicine and hoof care and may require modifications to existing facilities where these horses are kept.

However, don't automatically assume that horses are old and finished when they reach 15 years of age. Take a closer look at some of the active horses scattered throughout Texas' pens, arenas and trails. Aged horses are taking cows down the fence in cow-horse competitions, cutting cows at sanctioned events, moving and sorting cattle on ranches and feedlots, and transporting riders of all ages around show rings. Some

aged horses go to work most mornings of the week, performing tasks or just improving the quality of life for folks who like to own or ride a horse.

One in every 15 Texans is considered a horse enthusiast, and aged horses fill significant spots in a state where the horse remains deeply woven into the social fabric. Thanks to research-based guidelines for management and care, many older horses have a bright future in the Lone Star state, where the horse industry makes a more than \$11 billion contribution to the overall economy each year.

## GETTING MORE INFORMATION

For more information on horse management and care, visit Texas A&M University's animal science website at <http://animalscience.tamu.edu>.

## PROTECTING YOUR HORSES AND EQUIPMENT FROM THEFT

Whatever your horse's age you can help to keep him safe from thieves by following these suggestions:

- ▶ Consider permanent identification with brands, microchips or lip tattoos.
- ▶ Record permanent marks of brands with the county clerk in the county where horses live.
- ▶ Keep on hand current photographs of horses. Be sure photos include any unique marks, brands or color patterns.
- ▶ Establish an organized, easy-to-find proof-of-owner file with photos, registration papers, health certificates and any other information that helps identify horses and their owners.
- ▶ Secure barns, corrals or pens from the road, using good perimeter fencing.
- ▶ Use well-built gates that can be locked.
- ▶ Feed pastured horses well away from gates or roads, as horses will congregate around feeding areas, making them easier to catch.
- ▶ Regularly check on pastured horses. Consider a horse/facilities watch program with others in your area.
- ▶ Do not leave halters on pastured horses.
- ▶ Lock up your tack.
- ▶ Secure hitches on horse trailers or hide trailers from public view, making them harder to steal.
- ▶ Where appropriate, post warning signs on pasture gates and fences.

More detailed information on horse-theft awareness and prevention can be found in the following Texas A&M AgriLife Extension publications, available online, from your county Extension office, or from the State Extension Horse Specialist's office at Texas A&M University:

- ▶ *15 Steps to Minimize Theft of Horses and Equipment* (ANSC-PU-108)
- ▶ *Permanent Identification of Horses* (ANSC-PU-109)

## REFERENCES

- <sup>1</sup>P.G. Gibbs et al. 1998. *Report on the Texas horse industry*. Texas A&M AgriLife Extension. Equine Science Section. Department of Animal Science. Texas A&M University. 28 pgs. • L.L. Jones et al. 1993. *Population estimates for the Texas horse industry*. Departmental Information Report No. 94-2. Texas A&M University. 25 pages.
- <sup>2</sup>A.Q.H.A. 2003. *Official handbook of rules and regulations*. 51<sup>st</sup> edition. American Quarter Horse Association. Amarillo, Texas. 253 pgs.
- <sup>3</sup>W.M. El Shorafa et al. 1979. "Horse metacarpal bone: age, ash content, cortical area and failure stress interrelationships." *Journal of Animal Science* 49:979. • L.A. Lawrence et al. 1994. "The mechanical properties of equine third metacarpals as affected by age." *Journal of Animal Science* 72:2617.
- <sup>4</sup>J.W. Evans et al. 1977. *The horse*. W.H. Freeman and Company. San Francisco, CA.
- <sup>5</sup>S.L. Ralston 1993. *Management of old horses*. Rutgers Cooperative Extension. New Jersey Agricultural Experiment Station. #FS715. 4 pgs.
- <sup>6</sup>S.L. Ralston et al. 1988. "Differences in diagnostic test results and hematologic data between aged and young horses." *American Journal of Veterinary Research* 49:1387.
- <sup>7</sup>S.L. Ralston 1989. "Digestive alterations in aged horses." *Journal of Equine Veterinary Science* 9:203.
- <sup>8</sup>W.L. Scrutchfield, J. Schumacher and M.T. Martin. 1996. "Correction of abnormalities of the cheek teeth." *Proceedings: American Association of Equine Practitioners* 42:11.
- <sup>9</sup>S.L. Ralston and L.H. Breuer. 1996. "Field evaluation of a feed formulated for geriatric horses." *Journal of Equine Veterinary Science* 16(8):334.
- <sup>10</sup>S.R. Cooper et al. 1995. "Effects of dietary cation-anion balance on blood pH, acid-base parameters, serum and urine mineral levels and parathyroid hormone." In *Proceedings: 14<sup>th</sup> Equine Nutrition and Physiology Symposium*. Ontario, California. p. 42. • J.K. Hoyt, G.D. Potter et al. 1995. "Electrolyte balance in exercising horses fed a control and a fat-supplemented diet." In *Proceedings: 14<sup>th</sup> Equine Nutrition and Physiology Symposium*. Ontario, California. p. 62. • D.R. Topliff et al. 1989. "Changes in urinary and serum calcium and chloride concentrations in exercising horses fed varying cation-anion balances." In *Proceedings: 11<sup>th</sup> Equine Nutrition and Physiology Symposium*. Stillwater, Oklahoma. p. 1. • D.L. Wall, D.R. Topliff et al. 1993. "The effect of dietary cation-anion balance on mineral balance in the anaerobically exercised horse." In *Proceedings: 13<sup>th</sup> Equine Nutrition and Physiology Symposium*. Gainesville, Florida. p. 50.
- <sup>11</sup>N.R.C. 1989. *Nutrient requirements of horses*. 5<sup>th</sup> revised edition. National Research Council. Washington, D.C.
- <sup>12</sup>B.D. Scott, G.D. Potter et al. 1992. "Efficacy of a fat-supplemented diet on muscle glycogen concentrations in exercising Thoroughbred horses maintained in varying body condition." *Journal of Equine Veterinary Science* 12(2):105.
- <sup>13</sup>S.R. Cooper et al. 1995. "Effects of dietary cation-anion balance on blood pH, acid-base parameters, serum and urine mineral levels and parathyroid hormone." In *Proceedings: 14<sup>th</sup> Equine Nutrition and Physiology Symposium*. Ontario, California. p. 42.
- <sup>14</sup>D.R. Henneke, G.D. Potter et al. 1983. "A scoring system for comparing body condition in horses." *Equine Veterinary Journal* 16:371.
- <sup>15</sup>P.G. Gibbs and K.E. Davison. 1992. "A field study on reproductive efficiency of mares maintained predominately on native pasture." *Journal of Equine Veterinary Science* 12(4):219. • S.G. Vogelsang et al. 1987. Reproductive performance in mares subjected to examination by diagnostic ultrasound. In *Proceedings: 10<sup>th</sup> Equine Nutrition and Physiology Symposium*. Ft. Collins, Colorado. p. 649.
- <sup>16</sup>P.G. Gibbs and K.E. Davison. 1992. "A field study on reproductive efficiency of mares maintained predominately on native pasture." *Journal of Equine Veterinary Science* 12(4):219.
- <sup>17</sup>B.D. Scott, G.D. Potter et al. 1992. "Efficacy of a fat-supplemented diet on muscle glycogen concentrations in exercising Thoroughbred horses maintained in varying body condition." *Journal of Equine Veterinary Science* 12(2):105. • G.D. Potter et al. 1990. "Digestible energy requirements for work and maintenance of horses fed conventional and fat-supplemented diets." *Journal of Equine Veterinary Science* 10(3):214. • S.L. Oldham, G.D. Potter et al. 1990. "Storage and mobilization of muscle glycogen in exercising horses fed a fat-supplemented diet." *Journal of Equine Veterinary Science* 10(5):1. • K.E. Davison, G.D. Potter et al. 1991. "Lactation and reproductive performance of mares fed added dietary fat during late gestation and early lactation." *Journal of Equine Veterinary Science* 11(2):111.
- <sup>18</sup>B.D. Scott, G.D. Potter et al. 1993. "Efficacy of a fat-supplemented diet to reduce thermal stress and maintain muscle stores in exercising Thoroughbred horses." In *Proceedings: 13<sup>th</sup> Equine Nutrition and Physiology Symposium*. Gainesville, Florida. p. 66.

- <sup>19</sup>K.R. Wilson, G.D. Potter et al. 2003. "Alterations in the inflammatory response in athletic horses fed diets containing Omega - 3 polyunsaturated fatty acids." In *Proceedings: 18<sup>th</sup> Equine Nutrition and Physiology Symposium*. East Lansing, Michigan.
- <sup>20</sup>L.B. Jeffcott and W.E. Jones. 1990. "Studies of bone and exercise." *Equine Veterinary Data* 11(5):306.
- <sup>21</sup>B.D. Nielsen, G.D. Potter et al. 1997. "Changes in the third metacarpal bone and frequency of bone injuries in young Quarter Horses during race training." *Journal of Equine Veterinary Science* 17(10):541.
- <sup>22</sup>P.G. Gibbs et al. 1995. "Scientific principles for conditioning race and performance horses." *Professional Animal Scientist* 11(4):195.
- <sup>23</sup>S.J. Valberg. 2004. Metabolic disorders of muscle leading to exertional rhabdomyolysis in horses. In *Proceedings: Conference on Equine Nutrition*. Texas A&M University. p. 123. S.J. Valberg. 1996. Muscular causes of exercise intolerance in horses. *Veterinary Clinics of North America* 12:507.
- <sup>24</sup>N. Comben, R.J. Clark and J.B. Sutherland. 1984. "Clinical observations on the response of equine hoof defects to dietary supplementation with biotin." *Veterinary Record* 115:642.
- <sup>25</sup>J.A. Reynolds, G.D. Potter et al. 1997. "Genetic-diet interactions in the HYPP syndrome in Quarter Horses fed varying amounts of potassium." In *Proceedings: 15<sup>th</sup> Equine Nutrition and Physiology Symposium*. Fort Worth, Texas. p. 11.
- <sup>26</sup>H.M. Berschneider, A.T. Blikslager and M.C. Roberts. 1999. "Pathophysiology of equine gastric ulcers: effect of feeding frequency on gastric acid and bile salt concentrations." *Proceedings: 16<sup>th</sup> Equine Nutrition and Physiology Society* p. 87. • C.J. Hammond, D.K. Mason and K.L. Watkins. 1986. "Gastric ulceration in mature Thoroughbred horses." *Equine Veterinary Journal* 18:284. • C.G. MacAllister. 1995. "Medical therapy for equine gastric ulcers." *Equine Practices* p. 1070. • M.J. Murray, C. Grodinsky, C.W. Anderson and P.F. Radue. 1989. "Gastric ulcers in horses. A comparison of endoscopic findings in horses with and without clinical signs." *Equine Veterinary Journal Supplement* 7:68. • M.J. Murray, G.F. Schusser, F.S. Pipers and S.J. Gross. 1996. "Factors associated with gastric lesions in Thoroughbred racehorses." *Equine Veterinary Journal* 28(5):368. • J.A. Nadequ, F.M. Andrews, A.G. Mathew, R.A. Argenzio and J.T. Blackford. 1999. "Implications of diet in the cause of gastric ulcer disease in horses." *Proceedings: 16<sup>th</sup> Equine Nutrition and Physiology Society* p. 20. • F.M. Andrews, R.L., Sifferman, W. Bernard, F.E. Hughes, J.E. Holste, C.P. Daurio, R. Alva and J.L. Cox. 1999. "Efficacy of omeprazole paste in the treatment and prevention of gastric ulcers in horses." *Equine Veterinary Journal Supplement* 29:81.
- <sup>27</sup>S.A. Sorum, S.J. Valberg, W.E. Marsh and J.M. MacLeay. 1997. "The epidemiology of exertional rhabdomyolysis at a Midwestern racetrack." *Proceedings American Association of Equine Sports Medicine*. San Antonio, Texas. • S.J. Valberg, J.H. Jones, B.L. Smith and B. Sommerville. 1995. "Limitations to performance caused by skeletal muscle enzyme deficiencies." *Equine Veterinary Journal Supplement* 18:205. • S.J. Valberg, J.M. MacLeay and J.R. Mickelson. 1997. "Exertional rhabdomyolysis and polysaccharide storage myopathy in horses." *Compendium for Continuing Education of the Practicing Veterinarian* 19:1077. • B.A. Valentine, A.J. Reynolds, N.G. Ducharme, R.P. Hackett, H.F. Hintz, K.S. Petrone, M.D. Carlson, B. Barnes and P.C. Mountan. 1997. "Dietary therapy of equine polysaccharide storage myopathy." *Equine Practices* 19:30 • J.M. MacLeay, S.J. Valberg, J.D. Pagan, F. De La Corte, J. Roberts, J. Billstrom, J. McGinnity and H. Kaese. 1999. "Effect of diet on Thoroughbred horses with recurrent exertional rhabdomyolysis performing a standardized exercise test." *Equine Veterinary Journal Supplement* 30: 458. • F.D. De La Corte, S.J. Valberg, J.R. Mickelson and M. Hower-Moritz. 1999. "Blood glucose clearance after feeding and exercise in polysaccharide storage myopathy." *Equine Veterinary Journal Supplement* 30:324. • P.D. Siciliano. 2002. "Nutrition and feeding of the geriatric horse." *Veterinary Clinics of North America-Equine Practice* 18:491. • B. Carlstrom. 1932. "The etiology and pathogenesis of exertional rhabdomyolysis in draught horses." *Scandinavian Archives of Physiology* 63:164. • J.I. Fenton, K.A. Chlebek-Brown, J.P. Caron and M.W. Orth. 1999. "Glucosamine inhibits cartilage degradation in equine articular cartilage explants." *Proceedings 16<sup>th</sup> Equine Nutrition Physiology Society* p. 52. • R.R. Hanson, 1996. "Oral glycosaminoglycans in treatment of degenerative joint disease in horses." *Equine Practices* 18:18.