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Feeding and Nutrition for the Senior Horse

Introduction

The nutritional management of senior horses is a rising concern because of the increasing number of senior horses in the U.S. According to a recent survey, 7.5 percent of the total horse population is 20 years of age or older (USDA-NAHMS, 1998). The nutritional management of senior horses is challenging because there are no set criteria that define “old age” or the “senior” horse. The nutrient requirements of senior horses differ from other classes of horses because of the changes in metabolic and digestive efficiency that accompany the aging process. The onset of age-related diseases also effects nutrient requirements and the nutritional management of senior horses. The first step to good nutrition for the senior horse is determining if it is “senior.”

When is a horse considered “Senior”?

Although the terms “senior” and “old age” are synonymous, there are three ways in which age can be defined: 1. *Chronologic*, or the number of years of life from birth); 2. *Physiologic*, which relates to the decline in physiologic function); and 3. *Demographic*, which relates to survival of a subpopulation relative to the entire population (Paradis, 2002). There is no set chronological age where a horse is considered to be senior. It is commonly thought that 20 years of age or older is the threshold that defines a senior horse. However, chronological age alone is not a sufficient estimate for determining the nutritional needs of horses because there is so much variation between individual horses and how they age. A more effective way to determine if a horse is needs specific age-related feeding management is by taking into account its chronological age, physiological status, and physical signs of aging.

Physical Signs and Age-Related Diseases of the Senior Horse

Horses are individuals and just like people, they undergo a variety of physical changes with age. As horses age they also undergo physiological changes and are predisposed to certain age-related diseases. Some of common physical signs of aging and common diseases senior horses develop are:

- Loss of weight and decrease in body condition
- Loss of muscle mass over the top line
- Sway Back
- Hollow grooves above the eyes
- Graying hair coat
- Dental diseases
- Equine Metabolic Syndrome (including insulin resistance and laminitis)
- Equine Cushing’s Disease
- Kidney and Liver Dysfunction

Many of these physical signs are related, for example dental disease results in weight loss, and loss of muscling results in a sway back appearance. An important aspect of managing senior horses is adjusting their management prior to the onset of significant physical changes. When adjusting the nutritional program for any horse, you first must define its nutrient requirements.

Nutrient Requirements for the Senior Horse

Determining the nutrient requirements of senior horses is challenging because as horses age, their ability to digest and absorb nutrients declines. There are also age-related changes in metabolism which can be further affected by age-related diseases and disorders. Overall, there have been few studies examining the nutrient requirements and digestive function of senior horses. Because there is so much variation between horses and in the way horses' age, there are no specific nutrient requirements determined for senior horses (NRC, 2006). Most senior horses can be fed diets formulated based on maintenance requirements for normal adult horses or weanlings. However, studies have indicated reduced digestive ability in older horses thus affecting their energy, protein, amino acid, and micronutrient requirements.

Regardless of age, maintenance energy requirements vary between horses depending on their individual propensity for voluntary activity. In old age, it is thought that senior horses tend to engage in less voluntary physical activity, and thus have lower energy requirements. However, some age-related diseases result in weight loss and those horses may have higher energy requirements.

There is also evidence that the apparent digestibility of crude protein is lower in older horses compared to younger horses (Ralston et al., 2001), and thus their daily requirement may be higher (12 to 14%). Senior horses may also benefit from supplemental amino acids in their diet such as lysine and threonine in order to maintain muscle mass (Graham-Theirs and Kronfeld, 2005).

Although there is limited data available on micronutrient requirements of senior horses, studies have suggested decreased digestibility in older horse compared to younger horses, thus increasing their daily requirements for micronutrients. Phosphorous requirements may be higher in senior horses (0.4 to 0.65%), while calcium should remain at maintenance level (< 1%) to maintain a Ca:P ratio of approximately 1.5:1. Senior horses also require highly digestible fiber in their diet. Crude fiber content of a senior horse diet should be greater than 10%. Water intake is especially critical in senior horses in order to reduce constipation and impaction problems that are common in old horses. Senior horses should always have access to free choice water and salt.

Feeding Programs and Management for Senior Horses

Feeding programs and feeding management for senior horses depends largely on their dental health. Senior horses often have dental problems such as missing teeth, uneven wear, or sharp points which make food and water consumption difficult and even painful. The main goals of feeding programs for senior horses should be to maintain an optimal body condition score of 4 to 6 on a scale of 1 to 9 (Henneke et al., 1983) and minimize risks of nutritionally related disorders and diseases. The basic ingredients of a feeding program for senior horses should include high quality forage, a commercial concentrate designed for senior horses, fresh clean water, and salt.

Forages. Forages and long-stem hay should be the foundation of all horse diets. Horses should be fed a minimum of 1.5% bodyweight in forage per day (15 lbs for a 1,000 lb horse). Selecting forages should be based on quality; therefore pasture and hay should be analyzed for nutrient content. Senior horses need high quality hay with highly digestible fiber to compensate for their decreased digestive efficiency. Feeding forages to senior horses can be complicated by poor dentition and a reduced ability to chew. Grass pasture and hay, or grass/legume mixed hays are best for horses that do not have problems

chewing. While straight alfalfa is safe to feed most classes of horses, it is not recommended as the sole forage source for senior horses because its high calcium content may exacerbate kidney dysfunction. Other legumes such as clovers and by-products such as beet pulp and wheat bran are also high in calcium and should be avoided in horses with reduced kidney function.

Forage Alternatives. Horses that are missing teeth or have poor dentition must rely on alternative sources of fiber other than pasture and long-stem hay because their ability to graze and chew is limited. There are a variety of forage extenders that can be used to replace a portion of the long-stem fiber in their diet such as hay cubes, pelleted forage, chopped forage, high fiber by-products such as beet pulp and processed “complete” feeds. “Complete” feeds are high in fiber and in theory can be fed without feeding supplemental long-stem forages. Many of the commercially available feeds designed for senior horses are considered “complete” feeds.

Commercial Feeds. Most senior horses benefit from feeds that are designed specifically for older horses that are easy to chew and are highly digestible. Commercial feeds come in three forms: textured, pelleted or extruded (or a combination of any of the three). Textured feeds contain whole grains and can be more difficult to chew and digest for senior horses. Pelleted and extruded feeds are best for senior horses because they are easier to chew and more digestible. Senior horses tend to be more susceptible to choking, therefore soft pellets over hard pellets, or extruded feeds are safest. An extruded/pelleted feed mix has been shown to be more effective in maintaining body weight and condition in geriatric horses compared to a traditional textured sweet feed (Ralston and Breurer, 1996). Another benefit to pelleted and extruded feeds is that they can be soaked and made into a mash for horses that cannot chew. Mashers should be made to a soupy consistency to prevent choke (typically 1/2 gallon water per lb of feed, depending on the feed). Many of the processed forage extenders can also be made into mashers. Mashers not only improve feed intake, they also increase water intake which reduces digestive disorders.

Supplements and Additives. A variety of feed additives and supplements may benefit senior horses; however there is little research on the use of many supplements in horses. Feeds that contain digestive aids such as yeast cultures, prebiotics and probiotics may help increase digestive efficiency in senior horses. Supplemental Vitamin C may benefit the immune system of senior horses. Supplementation with fat, such as vegetable oil, helps maintain body condition without risk of digestive disorders associated with sugar and starch.

Feeding for Age-Related Diseases

Nutrition for geriatrics, or old horses with age-related diseases, has become more prevalent because horses are living longer and more data is available on nutritional risk factors for diseases and digestive disorders. Colic, pituitary adenomas (Equine Cushing's Disease), Equine Metabolic Syndrome (including insulin resistance, cresty necks, and laminitis), and arthritis are the some of the common age-related diseases in horses. Kidney and liver dysfunction may also occur in old horses, although they are less common. Nutrition is an integral part of managing all of these diseases in senior horses. Proper feeding management and exercise reduce risks of colic. A diet that is low in nonstructural carbohydrates (NSC), including sugar, starch, and fructan should be fed to horses with Equine Cushing's disease and Equine Metabolic Syndrome. Although the data is non-conclusive, joint supplements such as chondroitin sulfate may alleviate symptoms associated with arthritis. Horses with kidney dysfunction should be fed diets with restricted calcium, protein and phosphorous. Horses affected by liver problems are intolerant of high protein and fat in their diets. Senior horses should be evaluated thoroughly by a veterinarian to diagnose age-related diseases and appropriate diets and feeding programs should be incorporated

based on a complete physical exam. Not all old horses need specialty diets and many do well on diets formulated for normal adult maintenance requirements.

Other Considerations for Feeding Senior Horses

Senior horses should be offered meals frequently throughout the day and a single meal should never exceed 5 lbs. Senior horses should be separated from other horses during feeding to ensure their access to feed. Senior horses, especially those suffering from chronic pain from arthritis or other diseases, are less likely to be dominant and will be easily chased off during feeding time by aggressive horses. Nutrition is a key component of senior horse care, but regular deworming, vaccinating, and hoof care are all important aspects of managing the senior horse.

Summary

Chronological age alone is not sufficient for determining if the senior horse requires special nutritional management. Several factors affect the nutrient requirements and feeding management of senior horses such as the occurrence of age-related physical changes and diseases. Feeding programs for senior horses should be based on the individual horse and conditions that require special care, such as poor dentition or age related disease.

References

- Graham-Theirs, P. and D. Kronfeld. 2005. Amino acid supplementation improves muscle mass in young and old horses. *J. Anim. Sci.* 83:2783-2788.
- Henneke, DR, GD Potter, JL Kreider, and BF Yeates. 1983. Relationship between condition score, physical measurements and body fat percentage in mares. *Equine Vet J.* 15:371-382.
- Paradis, M.R. 2002. Demographics of health and disease in the geriatric horse. *Vet. Clinic. North Am. Equine Practice.* 18: 391-401.
- Ralston, S.L., K. Malinowski K., R. Christensen. 2001. Digestion in the aged horse revisited. *J EqVet Sci.* 21: 766-769.
- Ralston S.L. and L.H. Breurer. 1996. Field evaluation of feed formulated for geriatric horses. *J Eq Vet Sci.* 16:334-338.

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