



SOUTHERN STATES

Horse Feeding and Product Guide

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Nutrition Guidelines for Life Stage, Type and Clinical Disorders

Growing Horses

Foals

Foals should be allowed to nurse or be provided with sufficient high quality colostrum to provide a blood antibody concentration of 800 mg/dl or higher by 12 to 24 hours of age. High quality creep feed should be provided to foals by 3 to 4 weeks of age and fed at the rate of one pound per 100 pounds of body weight daily. Soft, high quality hay (min. 10% crude protein) should also be provided starting by one month of age. Foals that are creep fed for at least one month prior to weaning may be weaned when the foal is consuming at least 4 pounds of a high quality commercial horse feed and is at least 3 months old (feeding recommendation for light horse breeds).

Recommended Products: Legends Mare & Foal Textured and Pelleted, Triple Crown Growth Formula and Southern States Solution.

Orphan Foals

An orphan foal can be the result of the dam's death, rejection, illness or lack of milk production. Sufficient colostrum should be provided and then a high quality foal milk replacer can be fed to substitute for mare's milk and should be provided for the first 3 months of the foal's life. Foal milk pellets can also be provided or a high quality commercial horse feed can be fed. The weaning process may be started if the foal is at least 3 months of age and consuming at least 2 pounds of foal milk replacer pellets or 4 pounds of high quality commercial horse feed (feeding recommendation for light horse breeds such Quarter Horses, Paints, Thoroughbreds, Standardbreds, etc.).

Recommended Products: Mare's Match Foal Milk Replacer, Mare's Match Foal Pellets, Legends Mare & Foal (textured and pelleted formulas), Triple Crown Growth Formula and Southern States Solution.

Weanlings and Yearlings

Maintain steady growth rate to avoid developmental orthopedic disease (DOD). Use feeds with quality protein sources (soybean meal and guaranteed amino acids), high levels of trace minerals and vitamins, proper levels of calcium and phosphorus and low, controlled starch levels from feeds with fixed formulas. Provide a horse feed with an adequate protein level to meet total dietary protein requirements with available pasture or good quality hay (min. 10% crude protein, ADF < 40%, NDF < 60%). Total dietary protein levels should be 14% for weanlings and 12% for yearlings.

Defining nonstructural carbohydrates (NSC) as starch plus simple sugars, Cooperative Research Farms (CRF) equine nutrition research has shown that NSC intake should not exceed 1.0 g/kg BW per meal or 2.0 g/kg BW per day for normal horses (not insulin resistant) to prevent excessive post-feeding blood glucose and insulin responses. A practical recommendation is for concentrate NSC level to not exceed 33% when fed at

0.5% of body weight per meal or less. Use this recommendation also for growing horses.

Growing horses (3 to 12 months of age) should be provided feeds with added fat and digestible fiber and a low level of soluble carbohydrates (less than 33% simple sugar and starch content when fed at 0.5% of body weight per meal) to maintain normal post-feeding levels of blood glucose and insulin, since this has been implicated as a possible cause of developmental orthopedic disease (DOD).

Physeitis

For growing horses with physeitis, the following feeding programs are recommended:

1. Four-Month-Old Weanling with moderate physeitis (current weight of 371 pounds with mature weight of 1100 pounds). Reduce amount of feed (Legends Mare & Foal or Triple Crown Growth) to 4.0 pounds daily and 6.0 pounds daily of moderate quality grass hay with no pasture or turnout. This provides a 30% calorie reduction and should result in cessation of physeitis symptoms in 6 weeks. Then the feeding program can be increased to maintain a normal growth rate (1.8 pounds/day).
2. Four-Month-Old Weanling with severe physeitis (current weight of 371 pounds with mature weight of 1100 pounds). Feed Triple Crown 30% Supplement at 1.5 pounds daily and 6 pounds daily of moderate quality grass hay with no pasture or turnout. This provides a 40% calorie reduction and should result in cessation of physeitis symptoms in 6 weeks. Then the feeding program can be changed to an appropriate Legends or Triple Crown horse feed to maintain a normal growth rate (1.8 pounds/day).
3. Six-Month-Old Weanling with severe physeitis (current weight of 475 pounds with mature weight of 1100 pounds). Feed Triple Crown 30% Supplement at 2.0 pounds daily and 7 pounds daily of moderate quality grass hay with no pasture or turnout. This provides a 40% calorie reduction and should result in cessation of physeitis symptoms in 6 weeks. Then the feeding program can be changed to an appropriate Legends or Triple Crown horse feed to maintain a normal growth rate (1.59 pounds/day).
4. Yearling with moderate physeitis (current weight of 707 pounds with mature weight of 1100 pounds). Reduce amount of feed (Legends Grow & Perform or Triple Crown Growth) to 5 pounds daily and 9 pounds daily of moderate quality grass hay with no pasture or turn out. This provides a 30% calorie reduction and should result in cessation of physeitis symptoms in 6 weeks. Then the feeding program can be increased to maintain a normal growth rate (1.0 pounds/day).
5. Yearling with severe physeitis (current weight of 707 pounds with mature weight of 1100 pounds). Feed Triple Crown 30% Supplement at 2 pounds per day and 9 pounds daily of moderate quality grass hay with no pasture or turn out. This provides a 40% calorie reduction and should result in cessation of physeitis symptoms in 6 weeks. Then the feeding program can be changed to an appropriate Legends or Triple Crown horse feed to maintain a normal growth rate (1.0 lbs/day).

Higher fat feeds with added biotin, amino acids (lysine, threonine and methionine) rice bran, flaxseed, yeast culture and other digestive aids are recommended for weanlings and yearlings that are prepared for sales (increased weight gain, greater muscle development, improved hair coat and better hoof condition).

Recommended Products: Legends Mare & Foal Textured and Pelleted, Triple Crown Growth Formula, Legends Grow & Perform (textured and pelleted formulas), Southern States 14-Six, Southern States Solution and Triple Crown 14% Performance Formula.

Wobbler Syndrome

Wobbler syndrome (cervical vertebral stenotic myelopathy) occurs in young, rapidly growing horses, particularly Thoroughbreds, Quarter Horses and Warmbloods, with males being more commonly affected than females. Excessive feeding, high levels of physical activity and a trace mineral-deficient diet can be contributory factors. Clinical signs often can be reversed in animals less than 10 months old by reducing caloric intake and restricting exercise. Clinical signs usually become apparent between 6 months and 3 years of age and include cervical myelopathy, with hind limbs usually affected more severely. Radiography can be used to identify lesions causing compression in the cervical spinal cord. Treatment usually requires surgical decompression of the spinal cord or vertebral stabilization. Prognosis is guarded for surgical treatment. Feeding a low protein/low energy diet to confined weanlings genetically predisposed for wobbler syndrome had reduced wobbler symptoms and less cervical vertebral canal narrowing at eighteen months of age.

- Example Feeding Program for Six-Month-Old Weanling with Wobbler Syndrome (current weight of 371 pounds with mature weight of 1100 pounds). Feed Triple Crown Lite Formula at 2 pounds daily and 6 pounds daily of moderate quality grass hay with no pasture or turnout. This provides a 50% calorie reduction and 40% protein reduction and should result in a decreased growth rate.
- Example Feeding Program for Yearling with Wobbler Syndrome (current weight of 707 pounds with mature weight of 1100 pounds). Feed Triple Crown Lite Formula at 2 pounds daily and 8 pounds daily of moderate quality grass hay with no pasture or turn out. This provides a 50% calorie reduction and 55% protein reduction and should result in a decreased growth rate.

Recommended Product: Triple Crown Lite Formula.

Two Year Olds

Increase digestible energy intake from added fat and digestible fiber if horses are in training, control or limit starch intake and provide sufficient levels of calcium, phosphorus and magnesium for bone remodeling. Total dietary protein level should be between 10 and 12%.

Recommended Products: Legends Performance (textured and pelleted formulas), Legends Racing, Legends Grow & Perform (textured and pelleted formulas), Southern States Solution, Southern States 14-Six, Triple Crown 14% Performance Formula, Triple Crown Complete Formula and Triple Crown Training Formula.

Pleasure Horses

Feed according to age and activity level to maintain desired body condition. Total daily feed intake (hay/pasture and concentrate) should be 2.0 to 2.5% of body weight, with at 1.0% to 1.5% of this amount as forage (hay/pasture). Increase protein levels for more active horses, with a maximum dietary protein level of 12% for hard-working horses.

Defining nonstructural carbohydrates (NSC) as starch plus simple sugars, Cooperative Research Farms (CRF) equine nutrition research has shown that NSC intake should not exceed 1.0 g/kg BW per meal or 2.0 g/kg BW per day for normal horses (not insulin resistant) to prevent excessive post-feeding blood glucose and insulin responses. A practical recommendation is for concentrate NSC level to not exceed 33% when fed at 0.5% of body weight per meal or less.

Concentrates or feeds with added soy oil, biotin, rice bran, flaxseed, yeast culture, organic trace minerals and other digestive aids are recommended to improve hair coat and hoof condition and reduce stressful conditions in the horse's hindgut (found in Legends and Triple Crown Horse Feeds).

Recommended Products: Southern States Reliance Textured and Pelleted, Southern States 11-Six (textured and pelleted formulas), Southern States All Grain, Legends Show & Pleasure (textured and pelleted formulas), Triple Crown TLC, Triple Crown Low Starch and Triple Crown Complete Formula. If feeding rate is less than four pounds daily, switch to Triple Crown Lite. For limited pasture or hay feeding, use Southern States Hay Stretcher, Legends Senior, Legends Performance (pelleted), Triple Crown Complete Formula, Triple Crown TLC, Southern States Solution and Triple Crown Low Starch Formula.

Brood Mares

Maintain proper body condition at all times with feed well fortified with vitamins and minerals. Feed at slightly above maintenance requirements for digestible energy and protein until last trimester of pregnancy, and then increase dietary protein to at least 12% through foaling and early lactation. Use supplement pellet (Triple Crown 30% Performance Supplement if crude protein level of hay is less than 8%) or if less than four pounds daily of feed is needed to maintain good body condition.

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Recommended Products: Legends Grow & Perform, Legends Mare & Foal, Triple Crown 14% Performance Formula, Southern States Solution, Southern States 14-Six, Triple Crown Growth Formula and Triple Crown 30% Supplement.

Stallions

Feed a low, controlled-starch diet with added fat to maintain body condition and decrease colic risk and hyperactivity. Provide a feed highly fortified with vitamins and minerals during breeding season. Added fats with high omega-3 fatty acid content (from added marine algae and fish oil) can improve fertility in older stallions. Maximize feeding of good quality hay and pasture to maintain good body condition. Provide a dietary protein level of at least 12% during the active breeding season.

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Recommended Products: Legends Performance Textured and Low Carb Formula (pelleted), Legends Senior, Triple Crown TLC, Legends Grow & Perform (textured and pelleted formulas), Southern States Solution, Southern States 14-Six, Triple Crown Growth Formula, Triple Crown Senior Formula, and Triple Crown 14% Performance Formula.

Older Horses

Provide high calorie intake from feeds with added fat and digestible fiber to maintain good body condition with reduced hay consumption. Control starch levels to minimize insulin resistance and laminitis risk and provide a dietary protein level of 12% to maintain adequate muscle condition. Provide processed hay (chopped hay or hay cubes) to allow consumption by older horse with reduced dentition.

Defining nonstructural carbohydrates (NSC) as starch plus simple sugars, Cooperative Research Farms (CRF) equine nutrition research has shown that NSC intake should not exceed 0.5 g/kg BW per meal or 1.0 g/kg BW per day for insulin resistant horses to prevent excessive post-feeding blood glucose and insulin responses. A practical recommendation is for concentrate NSC level to not exceed 20% when fed at 0.5% of body weight per meal or less. Many older horses may be IR with a higher incidence of laminitis and older horses are more likely to colic, so the more conservative feeding recommendations for IR horses should apply to them.

Feeds with added soy oil, biotin, rice bran, flaxseed, yeast culture and other digestive aids are recommended to improve fiber digestion, hair coat and hoof condition (added to Legends and Triple Crown Horse Feeds).

Recommended Products: Triple Crown Senior Formula, Triple Crown TLC, Legends Senior, Southern States Hay Stretcher, Southern States Solution, Triple Crown Chopped Grass Forage, Triple Crown Chopped Alfalfa Forage, Triple Crown Safe Starch Forage, Triple Crown Alfalfa Cubes and Triple Crown Alfa/Timothy Cubes.

Performance Horses

Maximize caloric intake and muscle function with high fat, controlled starch diets and high levels of antioxidants (vitamin E, vitamin C and selenium) to maintain active muscle tissue and immune system function. Increase nutrient utilization with digestive enzymes, yeast culture, organic trace minerals, probiotics and lecithin compounds. Good quality hay should be fed to maximize caloric intake. Provide additional electrolytes, two to four ounces daily for hard-working, heavily sweating horses. For timed events where excess weight is a problem at reducing speed, limit hay to only 1.0% of body weight for 3 days prior to competition and feed hay in smaller, more frequent portions (result is reduction of 2% in body weight).

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Recommended Products: Legends Performance (textured and pelleted formulas), Legends Racing, Southern States Triple 10, Southern States 14-Six, Southern States 11-Six (textured and pelleted formulas), Legends Show & Pleasure (textured and pelleted formulas), Legends Grow & Perform (textured and pelleted formulas), Triple Crown 14% Performance Formula, Triple Crown Complete Formula, Triple Crown Rice Bran Oil Plus, Triple Crown TLC, Triple Crown Omega Max, Triple Crown Alfa-Lox Forage, Legends Pelleted Rice Bran and Legends Omega Plus.

Draft Horses

Feed a low controlled starch diet to minimize colic risk with well-fortified vitamin and mineral content due to lower feeding rate than light horse breeds. Provide grass hay instead of alfalfa hay for horses with maintenance needs to provide fewer calories for prevention of excessive body condition.

Defining nonstructural carbohydrates (NSC) as starch plus simple sugars, Cooperative Research Farms (CRF) equine nutrition research has shown that NSC intake should not exceed 1.0 g/kg BW per meal or 2.0 g/kg BW per day for normal horses (not insulin resistant) to prevent excessive post-feeding blood glucose and insulin responses. A practical recommendation is for concentrate NSC level to not exceed 33% when fed at 0.5% of body weight per meal or less.

For growing draft horses provide a diet with low soluble carbohydrate (sugar and starch) content. A supplement pellet (Triple Crown 30% Performance Supplement) or vitamin/mineral supplement (EquiMin Horse Mineral) may need to be added to the overall feeding program to increase nutrient density because of reduced grain feeding rate to maintain proper growth rate, especially if the daily concentrate amount is four pounds or less. Avoid excessive calorie intake and high starch concentrate diets.

For horses with Polysaccharide Storage Myopathy (Type-1 PSSM) and for horses affected with shivers, feed a concentrate with less than 10% starch and high fat content.

Added dietary fat or vegetable oil may be necessary for prevention of symptoms. Alfalfa and alfalfa/grass hays are preferred due to a lower soluble carbohydrate content than most grass hays. Avoid small grain hays such as ryegrass, wheat, oat, barley, and brome due to higher soluble carbohydrate content.

Recommended Products: Southern States Solution, Southern States 14-Six, Southern States 11-Six (pelleted and textured formulas), Legends Performance (textured and pelleted formulas), Legends Racing, Legends Senior, Legends Fortified Pelleted Rice Bran, Legends Omega Plus, Triple Crown Low Starch, Triple Crown Growth Formula, Triple Crown Complete Formula, Triple Crown Senior Formula, Triple Crown TLC, Triple Crown Rice Bran Oil Plus, Triple Crown Omega Max and Triple Crown 30% Supplement.

Ponies & Miniature Horses

Feed a low soluble carbohydrate diet with moderate fat levels due to high incidence of insulin resistance, obesity and laminitis. High levels of vitamin and mineral fortification are needed due to reduced feeding rates. Supplemental feed products with lower feeding rates and more concentrated vitamin and mineral levels provide for requirements without excessive caloric intake. Weight management programs with reduction of hay or pasture may be necessary.

Defining nonstructural carbohydrates (NSC) as starch plus simple sugars, Cooperative Research Farms (CRF) equine nutrition research has shown that NSC intake should not exceed 1.0 g/kg BW per meal or 2.0 g/kg BW per day for normal horses (not insulin resistant) to prevent excessive post-feeding blood glucose and insulin responses. A practical recommendation is for concentrate NSC level to not exceed 33% when fed at 0.5% of body weight per meal or less.

Recommended Products: Triple Crown Lite Formula, Triple Crown 30% Supplement, Triple Crown Safe Starch Forage, Legends Mare & Foal (textured and pelleted formulas), Legends Grow & Perform (textured and pelleted formulas).

Equine Metabolic Syndrome

Equine metabolic syndrome (EMS) has been identified in younger horses (less than 20 years of age) as a result of genetic predisposition and obesity. Symptoms include insulin resistance or IR (elevated blood insulin and glucose levels), regional adiposity (abnormal fat deposition in neck, sheath, tail head, and eye ridge) and increased incidence of subclinical and clinical laminitis.

Defining nonstructural carbohydrates (NSC) as starch plus simple sugars, Cooperative Research Farms (CRF) equine nutrition research has shown that NSC intake should not exceed 0.5 g/kg BW per meal or 1.0 g/kg BW per day for insulin resistant horses to prevent excessive post-feeding blood glucose and insulin responses. A practical recommendation is for concentrate NSC level to not exceed 20% when fed at 0.5% of body weight per meal or less.

Starch and simple sugars (characterized as ethanol soluble carbohydrates or ESC) are responsible for glycemic response in the horse. A total diet with soluble carbohydrate content (NSC or non-soluble carbohydrate content) of less than 10-12% in hay and concentrate for severe cases of laminitis has also been recommended. Hay can be soaked in hot water for 30 minutes or cold water for 60 minutes to significantly reduce soluble carbohydrate content.

Horses with insulin resistance, chronic laminitis and obesity should be muzzled and and/or provided limited pasture, or managed with limited hay in a dry lot. Routine exercise and turnout are essential recommendations, as they will help to decrease insulin resistance and normalize blood glucose and insulin levels.

Dietary supplementation with magnesium (2 grams per 100 lbs. of body weight) and chromium (1 mg per 100 lbs. of body weight) for horses exhibiting severe insulin resistance has also been recommended. Veterinary recommendations may include the use of levothyroxine (Thyro-L) to increase weight loss and normalize blood glucose and insulin levels. Supplementation of nutrients providing antioxidant (vitamin E, vitamin C and selenium) and anti-inflammatory (omega-3 fatty acids) properties have also been recommended.

Recommended Products: Triple Crown TLC, Triple Crown Low Starch, Triple Crown Senior Formula, Triple Crown Safe Starch Forage, Legends Senior, Legends Low Carb Formula Performance (pelleted) and Triple Crown Omega Max. Triple Crown 30% Supplement and Triple Crown Lite Formula for obese horses, ponies, miniature horses and “easy keeper” horse breeds.

Equine Cushing's Disease

Horses affected with Equine Cushing's Disease (ECD) may be insulin resistant (IR) with elevated blood glucose and/or blood insulin levels. Defining nonstructural carbohydrates (NSC) as starch plus simple sugars, Cooperative Research Farms (CRF) equine nutrition research has shown that NSC intake should not exceed 0.5 g/kg BW per meal or 1.0 g/kg BW per day for insulin resistant horses to prevent excessive post-feeding blood glucose and insulin responses. A practical recommendation is for concentrate NSC level to not exceed 20% when fed at 0.5% of body weight per meal or less.

Starch and simple sugars (characterized as ethanol soluble carbohydrates or ESC) are responsible for glycemic response in the horse. A total diet with soluble carbohydrate content (NSC or non-soluble carbohydrate content) of less than 10-12% in hay and concentrate for severe cases of laminitis has also been recommended. Hay can be soaked in hot water for 30 minutes or cold water for 60 minutes to significantly reduce soluble carbohydrate content.

Horses with IR, chronic laminitis and obesity should be muzzled and and/or provided limited pasture, or managed with limited hay in a dry lot. Routine exercise and turnout are essential recommendations, as they will help to decrease insulin resistance and normalize blood glucose and insulin levels.

Dietary supplementation with magnesium (2 grams per 100 lbs. of body weight) and chromium (1 mg per 100 lbs. of body weight) for horses exhibiting severe insulin resistance has also been recommended. Veterinary recommendations may include the

use of levothyroxine (Thyro-L) to increase weight loss and normalize blood glucose and insulin levels. Supplementation of nutrients providing antioxidant (vitamin E, vitamin C and selenium) and anti-inflammatory (omega-3 fatty acids) properties have also been recommended.

Recommended Products: Triple Crown Low Starch Formula, Triple Crown Senior Formula, Triple Crown TLC, Triple Crown Safe Starch Forage, Triple Crown Omega Max, Legends Senior and Legends Performance (pelleted). Triple Crown 30% Supplement and Triple Crown Lite Formula for obese horses, ponies, miniature horses and “easy keeper” horse breeds.

Colic and Laminitis (Dietary Related)

Control soluble carbohydrate intake and provide additional calories from fat and digestible fiber sources. Limit pasture consumption during spring and fall seasons due to high levels of plant starches and sugars (especially fructans in cool season grasses). Avoid small grain hays and pastures (oat, rye, wheat and barley) and fescue due to greater sugar content than other cool-season grasses (timothy and orchard grass) and alfalfa and grass/alfalfa mixed hay. Horses that are insulin resistant are more prone to laminitis, so follow feeding guidelines for IR horses for all horses with a history of colic and laminitis.

Several studies have documented the upper limit of starch digestion in the equine small intestine, which is 0.35% to 0.4% BW per meal or 0.35 to 0.4 g/kg BW of pure oat starch. Above this feeding level the rapid passage rate and limited amylase secretion in the equine small intestine allows starch to pass undigested into the cecum and colon, with the potential of resulting colic and laminitis. For a practical recommendation, with the knowledge that oat starch is the most digestible and other ingredients will be present in the concentrate, select a concentrate with a maximum of 50% starch content and limit concentrate feeding to 0.5% BW per meal to prevent starch overload.

Cooperative Research Farms (CRF) equine nutrition research has also shown that NSC intake should not exceed 1.0 g/kg BW per meal or 2.0 g/kg BW per day for normal horses (not insulin resistant) to prevent excessive post-feeding blood glucose and insulin responses resulting in excitability and increased risk of laminitis. A practical recommendation is for concentrate NSC level to not exceed 33% when fed at 0.5% of body weight per meal daily. For horses with a history of colic and laminitis, follow the more conservative CRF recommendation for IR horses and select a concentrate with 20% or less NSC (starch + simple sugar content) and limit feeding to 0.5% BW per meal or less.

Starch and simple sugars (characterized as ethanol soluble carbohydrates or ESC) are responsible for glycemic response in the horse. A total diet with soluble carbohydrate content (NSC or non-soluble carbohydrate content) of less than 10-12% in hay and concentrate for severe cases of laminitis has also been recommended. Hay can be soaked in hot water for 30 minutes or cold water for 60 minutes to significantly reduce soluble carbohydrate content.

Horses with IR, chronic laminitis and obesity should be muzzled and and/or provided limited pasture, or managed with limited hay in a dry lot. Routine exercise and turnout are essential recommendations, as they will help to decrease insulin resistance and normalize blood glucose and insulin levels.

Dietary supplementation with magnesium (2 grams per 100 lbs. of body weight) and chromium (1 mg per 100 lbs. of body weight) for horses exhibiting severe insulin resistance has also been recommended. Veterinary recommendations may include the use of levothyroxine (Thyro-L) to increase weight loss and normalize blood glucose and insulin levels. Supplementation of nutrients providing antioxidant (vitamin E, vitamin C and selenium) and anti-inflammatory (omega-3 fatty acids) properties have also been recommended.

Recommended Products: Triple Crown Low Starch, Triple Crown TLC, Triple Crown Safe Starch Forage (especially recommended for ponies and miniature horses). Triple Crown Senior Formula, Legends Senior and Legends Performance Pelleted (three of the lowest starch feeds) for horses in heavy training and competition, or in need of weight gain that have a history of chronic colic and/or laminitis. Triple Crown Lite Formula for horses that are easy keepers and/or obese.

Tying Up Diseases

Tying up, azoturia or exertional rhabdomyolysis can occur in any breed of horse and there are many causes. The most common cause is sporadic tying up, which occurs in horses that are exercised beyond their level of fitness. This is usually seen when horses are not regularly exercised and then are overworked. Other causes of sporadic tying up may occur from electrolyte and hormonal imbalances, overfeeding without regular activity, and vitamin E and selenium deficiencies.

Tying up disease, which is also called Polysaccharide Storage Myopathy (PSSM), is an inherited autosomal dominant metabolic muscle problem that is found in many horse breeds. Horses with PSSM have symptoms including exertional rhabdomyolysis or muscle tremors and gait abnormalities during exercise. A genetic mutation causes unregulated glycogen formation in the muscle of horses with Type-1 PSSM. This mutation is in a gene called GYS1 and it is responsible for the accumulation of excess glycogen in muscle cells and symptoms of PSSM in affected horses.

Type-1 PSSM occurs in Quarter Horse, Paint, Appaloosa, Morgan, Tennessee Walker, draft purebreds and crosses, and a small percentage of warm blood breeds. Type-2 PSSM is the form of tying up disease that affects most warm blood breeds, Arabians, Thoroughbreds and Standardbreds. The cause for Type-2 PSSM has not been discovered but is also likely due to a genetic mutation.

A genetic test for diagnosis of Type-1 PSSM is available using a hair root or blood sample for horse breeds known to have the GSY1 mutation. A muscle biopsy test can also be used for diagnosis of tying up disease, and further genetic testing will determine if it is Type-1 or Type-2 PSSM.

Both types of PSSM cause symptoms which include elevated blood serum levels of aspartate aminotransferase (AST) and creatine kinase (CK) enzymes, muscle stiffness and cramping, myoglobinuria, sweating and increased heart rate when exercised (all symptoms of exertional rhabdomyolysis), profuse sweating, muscle tremors, poor performance, difficulty in backing, hind limb weakness and abnormal gait.

Horses affected with Type-1 PSSM respond well to a low-starch diet. Select a horse feed with less than 10% starch content and hay with a low nonstructural carbohydrate (NSC) or starch plus simple sugar or ethanol soluble carbohydrate (ESC) content for horses with Type-1 PSSM. Horses affected with Type-2 PSSM also respond to a low soluble carbohydrate diet but the results are not as consistent. Review the feeding program to make sure that requirements for selenium, vitamin E and magnesium are met.

Use the same feed selection guidelines for Type-2 PSSM horses as for Type-1. Also consider adding more vegetable oil or high fat supplements (lowers glycemic response and reduces amount of dietary concentrate and starch) to the feeding program. Additional dietary magnesium, selenium and vitamin E supplementation has been recommended, as well as the use of dietary supplementation of thiamin, tryptophan and the use of tranquilizing drugs like reserpine for calming effects to reduce symptoms in Type-2 PSSM horses.

Because of the additional calories provided by vegetable oil, the concentrate feeding rate may be so reduced (less than four pounds daily) that a supplement pellet with a lower feeding rate (Triple Crown Lite Formula or Triple Crown 30% Supplement) and greater nutrient density may be required to meet the vitamin and mineral requirements due to the low rate of concentrate provided due to the large amount of oil or other fat source that is fed.

With tying up diseases, feeds that are based on digestible fiber and fat with low soluble carbohydrate content are recommended. Dietary fat levels of 0.5 pounds or more per day and fat providing 20% or more of daily dietary calories can be met with feeds containing 10% fat or more, as well as the use of high fat supplements and vegetable oil. Alfalfa and alfalfa/grass hays are preferred due to lower soluble carbohydrate content than most grass hays but also likely contain more calories on an equal weight basis, so they may need to be fed at a lower rate to avoid obesity. Supplementation with additional vitamin E (1,000 to 5,000 IU daily), selenium (150% to 200% of requirement or one extra gram per day), magnesium (200% of requirement or an extra 15 grams per day) and thiamin (1,000 to 2,000 mg/day) have been recommended to reduce symptoms in horses afflicted with tying up diseases and to treat any nutrient deficiency.

Recommended Products: Triple Crown Low Starch Formula, Triple Crown TLC, Triple Crown Lite Formula, Triple Crown 30% Supplement, Triple Crown Rice Bran Oil Plus, Triple Crown Omega Max, Triple Crown Senior Formula, Triple Crown Safe Starch Forage, Legends Performance Pelleted, Legends Senior, Southern States Hay Stretcher, Legends Fortified Pelleted Rice Bran and Legends Omega Plus.

Shivers

Shivers is a neuromuscular disease with symptoms that are similar to tying up disease and stringhalt. It occurs mainly in draft horse breeds, but other breeds can be affected. Symptoms of shivers include involuntary spasms of the muscles in the hind limbs and tail. The most characteristic symptom is one of the hind limbs being suddenly raised and trembling or “shivering” being observed for a few seconds to a few minutes along with the tail becoming suspended and trembling as well when the horse is made to back up, move over or a hind limb is raised for cleaning or shoeing. There are no elevated blood serum levels of CK and AST that occur in Type-1 and Type-2 PSSM.

A feeding program (hay and grain) with low levels of soluble carbohydrates is recommended. Concentrate NSC (starch plus simple sugars) level should not exceed 20% when fed at 0.5% of body weight per meal daily.

Dietary supplementation of selenium, magnesium and vitamin E is recommended to insure meeting requirements or treating a dietary deficiency, Supplemental or therapeutic dosage of vitamin E (5,000 to 10,000 IU/day) have been used with observed reduction of symptoms in some cases.

Recommended Products: Triple Crown Low Starch Formula, Triple Crown Safe Starch Forage, Triple Crown Senior Formula, Triple Crown TLC, Triple Crown Rice Bran Oil Plus, Triple Crown Omega Max, Triple Crown Lite Formula, Triple Crown 30% Supplement, Legends Performance Pelleted, Legends Senior and Southern States Hay Stretcher.

Stringhalt

Stringhalt is a neuromuscular condition that causes spasms and hyperflexion of one or both rear legs. The cause is unknown and recommended treatments have been tenectomy of the lateral extensor digit and removal of a portion of the hind limb muscle or the use of anticonvulsant drugs like phenytoin for chronic cases. Also, Botox (*Clostridium botulinum*) injections into the hind leg muscles of horses severely afflicted with stringhalt have shown a reduction in symptoms. Nutritional recommendations include a feeding program with a concentrate with a low level of soluble carbohydrates (starch and sugar) and supplementation with thiamin (vitamin B₁) and magnesium for reduced excitability. Additional selenium (1 mg/day), vitamin C (2 to 10 g/day) and vitamin E (5,000 to 10,000 IU/day) may be fed to increase antioxidant protection and may be helpful in reducing symptoms.

Recommended Products: Triple Crown Low Starch, Triple Crown Safe Starch Forage, Triple Crown Senior Formula, Triple Crown TLC, Triple Crown Rice Bran Oil Plus, Triple Crown Omega Max, Triple Crown Lite Formula, Triple Crown 30% Supplement, Legends Performance Pelleted, Legends Senior and Southern States Hay Stretcher.

Recurrent Airway Obstruction and Inflammatory Airway Disease

Horses with heaves or Recurrent Airway Obstruction (RAO) tend to be older and have respiratory difficulty at rest (increased respiratory rate and effort, coughing and excessive mucus). Inflammatory Airway Obstruction (IAD) affects younger horses, such as those in training, that don't show respiratory distress at rest but may cough, have increased mucus in the respiratory tract, and have reduced performance.

Both of these conditions are caused by inhaled allergens from the horse's environment and result in obstructing the normal flow of air in the lungs. The obstruction is caused by a combination of muscle spasms of the bronchial walls of lung tissue, narrowing of the bronchial walls due to thickening of tissue due to inflammation and the presence of fluid and mucus in the bronchial passages. The likely cause is an inflammatory response of the lung tissue to exposure to dust, pollen, molds and bacterial toxins.

The most important treatment is to reduce inhaled irritants like dust and mold from the environment. Ideally, affected horses are turned out at all times and are never stabled or fed indoors. Horses on pasture can develop pasture-associated obstructive pulmonary disease, especially during warm summer months that are likely due to pollen allergies. If affected horses are stabled, replace straw bedding with wood shavings, or provide pelleted wood bedding or processed paper-based bedding material to minimize dust.

Dietary treatment is to reduce the amount of hay fed to reduce dust exposure by utilizing high-fiber complete feeds. Complete feeds with a high fiber content based on beet pulp or soy hulls, with a crude fiber guarantee of at least 15% can be fed safely for extended periods with a minimum of hay (0.5% of body weight daily). Feed high quality hay soaked in water, chopped hay or hay cubes (90% less dust than baled hay).

Reduce environmental dust and mold by improving ventilation in the stall and provide for as much turnout as possible. Complete feeds or supplements containing higher levels of omega-3 fatty acids (found in flaxseed and fish oil) competitively inhibit activity of the cyclooxygenase enzyme, which is necessary for eicosanoid or prostaglandin production, and can be helpful in decreasing inflammation of the lung tissue.

Supplementation of vitamin C (5 to 10 grams daily) is recommended as lung tissue of horses with heaves has been found to be lower in ascorbic acid content than in normal horses, greater inflammation of lung tissue has been correlated with low lung vitamin C concentration, and vitamin C has been found to increase effectiveness of bronchodilator drugs like terbutaline and salbutamol. Increased amounts of vitamin E (1,000 to 2,000 IU above daily requirement) and supplemental selenium (1 mg above daily requirement) have also been recommended to improve immune response.

Recommended Products: Triple Crown Senior Formula, Triple Crown Complete Formula, Triple Crown TLC, Triple Crown Low Starch Formula, Triple Crown Omega Max, Triple Crown Rice Bran Oil Plus, Triple Crown Chopped Alfalfa Forage, Triple Crown Chopped Grass Forage, Triple Crown Safe Starch Forage, Triple Crown Alfalfa Cubes, Triple Crown Timothy/Alfalfa Cubes, Legends Racing, Legends Performance Pelleted, Legends Senior and Legends Omega Plus.

Hyperkalemic Periodic Paralysis (HYPP)

A horse suspected of being N/H or H/H should be on a low potassium diet. Select feed and hay with low potassium content (1.2% or less). Oats may be fed with a supplement pellet (Triple Crown 30% Performance Supplement) or a high fiber feed (Triple Crown Senior, Triple Crown Complete or Legends Maturity) can be fed along with a limited amount of hay. Avoid potassium-containing electrolytes and mineral supplements, as well as molasses, orchardgrass hay, alfalfa hay (baled, cubed or pelleted) or wheat bran, as they contain high levels of potassium.

Recommended Products: Triple Crown Low Starch, Triple Crown Senior Formula, Triple Crown Complete Formula, Legends Senior, Legends Performance (textured and pelleted) and Triple Crown 30% Supplement.

Excitable Behavior

The exact mechanism or cause for excitable behavior in the horse is not known. Horses can exhibit excitable behavior that are overfed and under worked, as well as horses that are stabled for long periods of time compared to horses allowed to graze for 16 to 18 hours daily, which is their normal activity. Horses may also exhibit stereotypic behaviors such as cribbing, wood chewing and stall weaving as a means to relieve stress. Feeding large amounts of grain is associated with increased gut acidity. High grain diets may cause pain due to increased gut acidity and ulcer formation, which can serve as a stimulus for stereotypic behavior. Feeding large amounts of grain can also lead to starch overload in the hindgut and can result in serious metabolic disorders such as colic, laminitis and insulin resistance. Reducing starch and adding fat to the diet has resulted in lowered blood glucose and insulin levels and calmer behavior has been observed in the horse.

Defining nonstructural carbohydrates (NSC) as starch plus simple sugars, Cooperative Research Farms (CRF) equine nutrition research has shown that NSC intake should not exceed 0.5 g/kg BW per meal or 1.0 g/kg BW per day for insulin resistant horses to prevent excessive post-feeding blood glucose and insulin responses. A practical recommendation is for concentrate NSC level to not exceed 20% when fed at 0.5% of body weight per meal or less. Another CRF study with this same limit of NSC intake showed reduced excitability in regularly exercised horses, so follow this recommendation for prevention of excitable behavior as well.

Recommended Products: Triple Crown Low Starch, Triple Crown Lite Formula, Triple Crown 30% Supplement, Triple Crown Senior Formula, Triple Crown Complete Formula, Triple Crown TLC, Triple Crown Safe Starch Forage, Legends Senior, Legends Performance Pelleted, Southern States Solution, Southern States Hay Stretcher, Southern States Reliance Pelleted, Legends Fortified Pelleted Rice Bran, Legends Omega Plus and Triple Crown Rice Bran Oil Plus.

Equine Protozoal Myelitis (EPM)

EPM is a neurological disease. Diagnosis of EPM is based upon finding antibodies, or more recently, a DNA detection test from blood or cerebrospinal fluid. A feed low in soluble carbohydrates with a high content of digestible fiber and fat is recommended since there is an increased incidence of diarrhea as a side effect of treatment. High quality forage is indicated also as weight loss is a common symptom of horses afflicted with EPM. High levels of folic acid and vitamin E should be present in the feed, or added as supplements to help rebuild damaged nerve and muscle tissue. A vitamin E and selenium supplement (providing at least 1,000 IU of vitamin E and 1 mg of selenium per day) is recommended as deficiency symptoms for vitamin E and selenium could be similar to EPM symptoms.

Vitamin E supplementation of 5,000 to 10,000 IU per day has also been recommended to assist with reduction of EPM symptoms. A horse feed with quality protein (soybean meal as protein source) of 12% to 14% with high levels of limiting amino acids (lysine, threonine and methionine) is also recommended to rebuild damaged muscle tissue.

Recommended Products: Triple Crown Senior Formula, Triple Crown Growth Formula, Triple Crown TLC, Legends Grow & Perform Textured and Pelleted, Southern States Solution, Legends Senior, Legends Performance Textured and Pelleted.

Gastric Ulcers

Higher intensity levels of training and competition are correlated with an increase in the incidence of ulcers. Horses suffering from ulcers should be treated immediately. Allowing the horse to be turned out and graze 24 hours daily will help to alleviate ulcers as the stress level will be reduced and increased saliva production will help reduce stomach acidity and prevent further damage. Fermentation of fat and fiber will not produce lactic acid, selection of a horse feed with high levels of fat and digestible fiber and low levels of soluble carbohydrates will reduce fermentation and acid production in the stomach and small intestine where ulcers form.

Providing enough hay or pasture in the diet (1.0 to 1.5% dry matter content of body weight daily) is important to insure adequate salivary bicarbonate to buffer stomach acidity. Feeding a daily buffer or antacid product may be required to maintain an ulcer-free condition with some horses. Alfalfa or a legume\grass mixed hay may be preferred due to the higher calcium content and potential stomach buffering capacity. Increasing the frequency of feeding can be helpful in keeping stomach pH less acidic with more constant saliva production and the dilution effect of a more consistently full stomach.

Recommended Products: Triple Crown Low Starch Formula, Triple Crown Senior Formula, Triple Crown TLC, Triple Crown Chopped Alfalfa Forage, Triple Crown Complete Formula, Triple Crown Alfa-Lox Forage, Legends Racing, Legends Senior, Legends Performance Pelleted, Southern States Solution, Southern States 11-Six Pelleted and Southern States Hay Stretcher.

Colonic Ulcers and Right Dorsal Colitis

Like gastric ulcers, colonic ulcers are found more often in performance horses. There is also a strong association with the use of non-steroidal anti-inflammatory drugs (NSAID) and colonic ulcers. Colonic ulcers with symptoms including mild colic symptoms, lethargy and partial anorexia can progress to Right Dorsal Colitis (RDC) with anorexia, fever and diarrhea causing dehydration, protein loss and weight loss.

Treatment of RDC includes discontinuing use of NSAID, decreasing gut fill to allow the colon to rest, reducing inflammation and restoring normal colon absorptive function. Decreasing the amount of gut fill due to long-stemmed hay can be accomplished by elimination or major reduction of hay from the diet. Replace all or most of the hay with a high-fiber (15% crude fiber or greater) complete feed. Feeding a complete pelleted feed at 1.0 to 1.5% of body weight daily and cubed hay at 0 to 0.5% of body weight daily will meet the maintenance requirements of most horses. This feeding program reduces gut fill and decreases the mechanical abrasion and weight load on the large colon. The horse can also be allowed to graze small amounts of fresh grass for short periods (10 to 15 minute intervals up to 6 times daily) to assist in weight gain. The dietary changes should be made over a week's time to allow the gastrointestinal (GI) tract time to acclimate. The complete feed diet should be continued for 3 to 4 months or until hypoproteinemia and hypoalbuminemia has been resolved.

Psyllium husk (4 to 8 ounces daily) can also be added to the diet to shorten transit time of ingesta, increase water content of the GI tract, and provide a better microbial environment conducive to healing (increased production of butyrate for colonocytes, their preferred source of nutrition). Sucralfate is recommended as the most effective medication for treatment of colonic ulcers. Complete feeds or supplements containing higher levels of essential fatty acids should facilitate replacement of phospholipids in cell membranes in the colon. Feeds and supplements containing added omega-3 fatty acids (found in flaxseed, marine algae and fish oil) competitively inhibit activity of the cyclooxygenase enzyme, which is necessary for eicosanoid or prostaglandin production, and can be helpful in decreasing inflammation of the colon.

Minimizing stress will also be helpful in controlling RDC. Stall rest, reduction in strenuous exercise or training, and reduction in transport activities are ways to reduce stress. Horses should also have adequate amounts of clean fresh water and a complete mineral supplement with salt to ensure adequate water intake.

Recommended Products: Triple Crown Low Starch Formula, Triple Crown Senior Formula, Legends Senior, Triple Crown TLC, Legends Performance Pelleted, Southern States Hay Stretcher, Triple Crown Alfa-Lox Forage, Triple Crown Chopped Alfalfa Forage, Triple Crown Chopped Grass Forage, Triple Crown Alfalfa Cubes, Triple Crown Timothy-Alfalfa Cubes, Triple Crown Rice Bran Oil Plus, Triple Crown Omega Max, Legends Omega Plus and EquiMin Horse Mineral.

Enteroliths

Enteroliths are intestinal stones that are a cause of impaction colic in the horse. They are mineral concretions composed mainly of magnesium, ammonium and phosphate salts. Contributing factors to enterolith formation include excessive mineral intake, alfalfa hay consumption, Arabian, Morgan and American Miniature breeds, ingestion of foreign particles (plastic, wire, gravel, string, hair, etc.), geographic location (higher incidence in the states of Texas, Florida and California), and lack of pasture grazing with prolonged stall confinement.

Feeding recommendations to decrease the incidence or recurrence of enteroliths include eliminating alfalfa hay, elimination of feed supplements that are high in calcium, phosphorus, magnesium or protein (wheat bran, alfalfa pellets, beet pulp, etc.), providing a low-protein horse feed, no free-choice mineral except white or trace mineralized salt, allowing daily pasture grazing, removing access to any foreign particles from pasture or turnout areas, increasing grain feeding frequency to 3 to 4 times daily and daily turnout.

Formation of enteroliths occurs at an alkaline pH (6.5 or greater). Increasing the grain to hay ratio (more grain and less hay), increasing the soluble carbohydrate (starch and sugar) content of the concentrate and feeding one to two cups of vinegar daily are recommendations that will decrease intestinal pH and may aid in decreasing formation of enteroliths.

Recommended Products: Triple Crown Grass Forage, Southern States All Grain, Southern States Reliance Textured and Pelleted, Southern States Hay Stretcher and Legends Show & Pleasure (textured and pelleted).

Obesity

Reducing caloric intake and exercise to increase caloric expenditure are the two methods that can be used to reduce excess body weight. The most effective method to keep horses from becoming overweight is to control intake of feed, hay and pasture. Horses on lush pasture may be fitted with grazing muzzles or placed in a dry lot and fed average quality grass hay. Weigh the feed and hay to determine the amount fed, and adjust the feeding rate to maintain an appropriate body condition score. Weight gains and losses can also be monitored with a weight scale or weight tape.

The use of a concentrated feed supplement or ration balancer pellet (Triple Crown Lite Formula and Triple Crown 30% Supplement) allows sufficient intake of minerals and vitamins while reducing calories associated with reducing conventional horse feeds to less than 0.5% of body weight (i.e. less than five pounds daily for a 1,000-b horse).

Another way to insure adequate mineral and vitamin intake when feeding a reduced amount of a conventional horse feed is to provide a mineral/vitamin supplement (EquiMin Horse Mineral). Horses in training should be fed a lower-calorie feed but in sufficient amounts to meet dry matter and other nutrient requirements (minimum of 1.0 to 1.5% of body weight daily for total diet).

Use the following formula to determine the proper healthy weight (Desired Body Weight or BW) of obese horse. Determine body weight (Current BW) and body condition score (Current BCS) of your horse. Apply the formula: (Current BW - (Current BCS - Desired BCS x 50) = Desired BW. For example, the horse weighs 1,200 lb. and has a BCS of 8. You want a BCS of 5 so the formula is: 1,200 lb. - (8 - 5 x 50 lb.) = 1,050 lb., which is the desired or target weight for the horse.

To accomplish a decrease of one body condition score in two months, caloric intake must be reduced by 6,000 kcal per day. This requires one of the following changes in the feeding program: decreasing concentrate by 4 lb. per day, decreasing hay intake by 6-7 lb. per day or decreasing pasture intake by 6 hours per day.

Recommended Products: Triple Crown Lite Formula, Triple Crown 30% Supplement, Triple Crown Safe Starch Forage, EquiMin Horse Mineral, and EquiMin Horse Mineral Block.

Weight Loss

Horses with weight issues need feeds high in fat and digestible fiber to increase caloric intake safely without a risk of colic and laminitis from a diet high in soluble carbohydrates. Fat contains 2.25 times more calories than any other nutrient, so high fat feeds and supplements will provide the most calories for weight gain. Digestible fiber sources (beet pulp, soy hulls and alfalfa meal) used in many Southern States horse feeds are relatively high in calories and low in starch, and provide a safety margin when fed at high rates to increase weight gain. High quality forage should be selected, as it is more palatable, allowing greater intake, and has a higher caloric density, providing more calories per pound. Feeds containing yeast culture, probiotic bacteria, digestive enzymes and other feed additives that enhance digestion are useful in adding weight to thin horses.

To accomplish an increase of one body condition score in two months, caloric intake must be increased by 6,000 kcal per day. This requires one of the following changes in the feeding program: increasing concentrate by 4 lb. per day, increasing hay intake by 6-7 lb. per day or increasing pasture intake by 6 hours per day.

Recommended Products: Triple Crown Senior Formula, Triple Crown Complete Formula, Triple Crown TLC, Legends Grow & Perform (textured and pelleted), Legends Performance Textured and Performance Pelleted, Legends Senior, Southern States 11-Six Textured and Pelleted, Southern States 14-Six, Southern States Triple 10, Southern States Solution, Legends Fortified Pelleted Rice Bran and Legends Omega Plus.

Choke or Esophageal Obstruction

Choke or esophageal obstruction occurs when the horse is provided with food items that are too large to be quickly chewed into smaller particles, like carrots or alfalfa cubes, when consumption is too rapid and the horse tends to "bolt" his feed, and when the horse has a dental problem and is not able to properly chew its feed. Choke is observed more often with pelleted horse feeds and consumption must be slowed in order to prevent further episodes of choking.

Measures to slow consumption rate and prevent choke include lowering the feeder, providing a larger feeder so that feed is available in a more shallow manner, placing objects (large stones or individual salt blocks) in the feeder, wetting or soaking the feed with water, and mixing ½ to two pounds of chopped forage, soaked alfalfa cubes or soaked beet pulp with the concentrate meal.

Regular dental examinations with treatment (floating of sharp points on dental ridges, etc.) will help to prevent episodes of choke. Horse treats, hay cubes and carrots that are given to the horse should be reduced to the size of a thumb, and beet pulp and alfalfa cubes that are not fed off the ground and added to a concentrate meal should be soaked with water for fifteen minutes before feeding. Once a choke has occurred and scar tissue in the throat has formed, all feed and hay should be soaked with water for several weeks after the incident has occurred to prevent further choking episodes and irritation of the area. Pelleted high-fiber horse feeds and cubed hay soaked with enough water to form a mash is recommended for feeding horses that are recovering from choke.

Recommended Products: Legends Senior, Legends Performance Pelleted, Legends Senior, Triple Crown TLC, Triple Crown Senior Formula, Southern States Solution, Southern States 11-Six Pelleted, Southern States Hay Stretcher, Triple Crown Alfalfa-Timothy Cubes and Triple Crown Alfalfa Cubes.

Kidney Disease

Clinical signs of kidney disease include lethargy, depression, poor appetite, ulceration of the mouth and tongue, and swelling of the legs and belly. Many drugs are toxic to the kidney and can severely reduce kidney function during treatment but complete recovery usually occurs. Dietary management is less important during this time and it is more important to keep the horse eating and drinking normally.

Horses with chronic kidney or renal disease have a poor prognosis for recovery and should be maintained on a strict diet to limit protein, phosphorus and especially calcium. With reduced kidney function an excessive amount of calcium oxalate is secreted into the urine and can form stones in the urinary tract. Avoid feeds or supplements high in protein, calcium or phosphorus for horses with renal disease, this would exclude most commercial horse feeds. Good quality grass hay with no more than 10% crude protein content should be the major portion of the diet. A small amount of whole or crimped oats would be the only recommended grain to feed. Omega-3 fatty acid supplementation has been recommended to reduce renal inflammation for long-term care of chronic cases to avoid the adverse effects of NSAID use.

Feeding legume hay like alfalfa, clover or excess protein does not cause kidney disease in healthy horses, but is not recommended for horses with renal disease. Avoid feeding beet pulp and wheat bran due to high levels of calcium or phosphorus. Use caution with salt supplementation as some horses may overeat salt. Instead of allowing free-choice consumption of salt, add 1-2 ounces of plain salt to the feed daily.

Recommended Products: Triple Crown Safe Starch Forage, Triple Crown Whole Oats, Triple Crown Steam Crimped Oats, Triple Crown Omega Max and Triple Crown Chopped Grass Forage.

Liver Disease

Horses with liver or hepatic disease should be fed easily digested soluble carbohydrate sources in order to maintain blood glucose levels, and diets high in fat or protein are not recommended. Horses with hepatic failure could also be supplemented with B-complex vitamins (i.e. Red Cell) and ascorbic acid (stabilized or esterified form of vitamin C) as the liver is the site of all vitamin syntheses.

Recommended Products: Southern States All Grain, Southern States Reliance Textured and Triple Crown Chopped Grass Forage.

Hyperlipidemia

Hyperlipidemia occurs in horses and other equids due to poor feed quality or decreased feed intake, especially during a period of high-energy requirement such as pregnancy, disease or lactation. The negative energy balance triggers excessive mobilization of fatty acids from adipose tissue. Hyperlipidemia occurs most commonly in ponies, miniature horses and donkeys, and less commonly in standard-sized horses.

Symptoms include lethargy, weakness, inappetence, decreased water consumption and diarrhea. There is often a previous history of prolonged anorexia, rapid weight loss and obesity. Blood serum values usually indicate impaired liver function when testing ponies and miniature horses with hyperlipidemia (excessive fat in the blood). Clinical signs also may include excessive plasma or serum triglyceride levels, blood plasma with a whitish or yellowish discoloration, metabolic acidosis and hypokalemia (low blood potassium). Nutritional support includes supplemental B-complex vitamins and frequent feedings of a high-carbohydrate, low fat feed if the animal will voluntarily consume an adequate amount.

Recommended Products: Southern States All Grain, Southern States Reliance Textured.

Inflammatory Bowel Disease

Inflammatory Bowel Disease (IBD) is a malabsorptive and maldigestive disorder that most commonly affects the small intestine of mature horses. The cause of IBD has been linked to abnormal immune responses to bacterial, viral, parasitic or dietary antigenic factors. Different types of IBD have been identified including eosinophilic enteritis, granulomatous enteritis, lymphocytic/plasmacytic enteritis and lymphosarcoma.

Dietary recommendations include a nutrient-dense feed with highly-digestible fiber sources and low levels of soluble carbohydrates. Enzymatic digestion in the small intestine may be severely limited and chronic and severe colic is a common symptom of IBD. These symptoms can be reduced by limiting the amount of soluble carbohydrate in the feed in order to reduce the amount available for fermentation in the large intestine. A study found reduced inflammatory bowel issues with elimination of all gluten-containing feed ingredients, so a concentrate diet containing no wheat, oat, barley or rye products may be considered if symptoms of IBD are not reduced with a conventional feeding program.

Providing smaller meals at more frequent intervals is recommended (3-4 times per day) as the amount of feed required to maintain adequate body condition is greater than normal for horses with this condition and the occurrence of excessive fermentation of soluble carbohydrates in the large intestine and colic symptoms should be reduced.

Recommended Products: Triple Crown Senior Formula, Triple Crown Low Starch Formula, Triple Crown TLC, Triple Crown Omega Max, Triple Crown Rice Bran Oil Plus, Legends Performance Pelleted, Legends Senior, Southern States Hay Stretcher, Triple Crown Chopped Grass Forage, Triple Crown Chopped Alfalfa Forage, Triple Crown Safe Starch Forage, Triple Crown Alfalfa Cubes and Triple Crown Alfa/Timothy Cubes.

Starvation

“Refeeding Syndrome” can occur in horses, and severely starved individuals may die within a few days to a week after starting a feeding program. The problem occurs when a severely starved horse eats a high carbohydrate meal, insulin is released and causes glucose to be absorbed into the body cells, but it also draws the electrolytes magnesium and potassium out of the bloodstream and into body cells. The starved horse doesn't have an adequate store of these electrolytes and their depletion can lead to heart, respiratory or kidney failure and subsequent death.

Equine nutrition research has shown the safest way to start a feeding program for a starved horse is to offer small frequent meals of high quality alfalfa hay. Start the feeding program by offering one pound of alfalfa hay every 3 to 4 hours for a total of six pounds in 24 hours for a horse weighing 500 pounds (7 pounds in 24 hours for a 600-pound horse or 8 pounds in 24 hours for a 700-pound horse). Follow this feeding program for the first three days and provide fresh, clean water at all times.

If the horse tolerates this program with no diarrhea or other problems, keep increasing the amount of alfalfa hay fed and decrease the number of feedings. After the first three days, a horse with an initial weight of 500 pounds should be fed four pounds of alfalfa hay every 6 to 8 hours for a total of 10 pounds daily by the sixth day (total of 12 pounds daily for a 600-pound horse or 14 pounds daily for a 700-pound horse). Keep increasing the amount of alfalfa hay fed and decrease feedings to twice per day, so that by two weeks horses are receiving at least the following amounts based on initial body weight (500-pound horse: 13 pounds daily, 600-pound horse: 15 pounds daily, 700-pound horse: 17 pounds daily). After two weeks, the horse may be fed alfalfa hay on a free-choice basis.

After two weeks into the feeding program, introduction to pasture can begin with an hour of pasture access for three to four days. Gradually increase pasture time over a period of 10 to 14 days and then daily or 24-hour access can be allowed. Also, if alfalfa hay is not readily available and another type of hay is more available or economical, the horse may be gradually changed to another type of hay over the next two weeks so that alfalfa hay no longer is fed after four weeks into the feeding program.

A complete horse feed and mineral/vitamin supplement can be introduced after the initial two-week feeding period. Limit the amount of mineral to only an ounce daily for the first week, two ounces daily for the second week and then free-choice access can be allowed or the recommended amount may be top-dressed onto feed at meal times. Introduce feed gradually, providing one pound twice daily and then increase the amount

by one additional pound each day. Depending on the amount and quality of hay fed, feeding rates up to 1% of body weight daily can be allowed. Legends and Triple Crown horse feeds with high quality protein sources, added fat, elevated mineral and vitamin fortification and low levels of starch and sugar are excellent feeds for horses needing to gain large amounts of muscle tissue.

For older horses (20 years of age or more) with poor tooth condition, the ability to chew long-stemmed hay may be lost. Feed the older horse Legends Senior or Triple Crown Senior and Triple Crown Alfalfa Hay Cubes or Chopped Alfalfa Forage, gradually increasing the amount of feed to 1% or more of body weight daily and cubed or chopped alfalfa hay to 0.5% to 1% of body weight daily.

The feed and forage may need to have water added to form a mash if the horse's dental condition is very poor. Fat supplements may also be added at this time. Also remember to decrease the amount of feed once desired body condition is achieved.

After two months on a successful feeding program, the horse has regained some strength and become familiar with its surroundings, so now is the time to perform parasite control, dental care and updating vaccinations. After three to five months of care and feeding, a severely starved horse should be rehabilitated to a normal body weight.

Recommended Products: Legends Senior, Legends Performance Pelleted, Legends Fortified Rice Bran, Legends Omega Plus, Triple Crown Senior Formula, Triple Crown TLC, Triple Crown Complete Formula, Triple Crown Rice Bran Oil Plus, Triple Crown Omega Max, Triple Crown Alfalfa Cubes, Triple Crown Chopped Alfalfa Forage and Triple Crown Low Starch.

Feeding Recommendations for Warm Blood and Sport Horses in Show and Performance Activities^{1,6}

Body Weight and Activity Level	Hay² (lb./day)	Triple Crown 30% Supplement (lb./day)	Legends Omega Plus (lb./day)	Legends Performance or Triple Crown Complete (lb./day)^{3,4}
Light				
1200 lb.	14	1	1	-
1300 lb.	15	1	1	-
1400 lb.	16	1	1	-
1500 lb.	18	1	1	-
1600 lb.	19	1	1	-
Moderate⁵				
1200 lb.	16	1	1	-
1300 lb.	18	1	1	-
1400 lb.	19	1	1	-
1500 lb.	22	1	1	-
1600 lb.	23	1	1	-
Heavy⁵				
1200 lb.	18	1	1	1
1300 lb.	19	1	1	1
1400 lb.	21	1	1	1.5
1500 lb.	22	1	1	1.5
1600 lb.	24	1	1	2
Intense⁵				
1200 lb.	18	-	1	6
1300 lb.	19	-	1	7
1400 lb.	21	-	1	7
1500 lb.	22	-	1	8
1600 lb.	24	-	1	8

¹Recommendations based on 70% of NRC₂₀₀₇ Digestible Energy (DE) requirements.

²Recommendations based on hay with minimum 8% crude protein and 0.80 DE Mcal/lb. (as fed basis).

³Increase or add concentrate by 1 lb. for every 2 lb. less hay fed.

⁴Decrease concentrate by 1 lb. for every 2 lb. more hay fed.

⁵Add an electrolyte supplement to the daily feeding program at moderate activity level and above.

⁶Light activity is recreational and show riding at 1-3 hours/week; moderate activity is schooling, show riding, training, breaking and polo at 3-5 hours/week; heavy activity is ranch work, polo, show, race training, upper-level dressage, reining, cutting, etc. at 4-5 hours/week; intense activity is racing, 3-day eventing, endurance with 1 hour/week of speed work or 6-12 hours of slower work/week.

Feeding Recommendations for Light Breed Horses in Show and Performance Activities^{1,6}

Body Weight and Activity Level	Hay ² (lb./day)	Triple Crown 30% Supplement (lb./day)	Legends Omega Plus or Pelleted Rice Bran (lb./day)	Legends Performance or Triple Crown Complete (lb./day) ^{3,4,7}
Light				
900 lb.	14	0.5	1	1.5
1000 lb.	15	0.5	1	2.5
1100 lb.	17	0.5	1	3
1200 lb.	18	0.5	1	3.5
1300 lb.	20	0.5	1	4
Moderate⁵				
900 lb.	14	-	1	4
1000 lb.	15	-	1	5
1100 lb.	17	-	1	5.5
1200 lb.	18	-	1	6.5
1300 lb.	20	-	1	7
Heavy⁵				
900 lb.	14	-	-	6.5
1000 lb.	15	-	-	8
1100 lb.	17	-	-	8.5
1200 lb.	18	-	-	10
1300 lb.	20	-	-	10.5
Intense⁵				
900 lb.	14	-	-	11
1000 lb.	15	-	-	12.5
1100 lb.	17	-	-	14
1200 lb.	18	-	-	15.5
1300 lb.	20	-	-	16.5

¹Includes Thoroughbred, Standardbred, Quarter Horse and Paint breeds.

²Recommendations based on hay with minimum 8% crude protein and 0.80 DE Mcal/lb. (as fed basis).

³Increase concentrate by 1 lb. for every 2 lb. less hay fed.

⁴Decrease concentrate by 1 lb. for every 2 lb. more hay fed.

⁵Add an electrolyte supplement to the daily feeding program at moderate activity level and above.

⁶Light activity is recreational and show riding at 1-3 hours/week; moderate activity is schooling, show riding, training, breaking and polo at 3-5 hours/week; heavy activity is ranch work, polo, show, race training, upper-level dressage, reining, cutting, etc. at 4-5 hours/week; intense activity is racing, 3-day eventing, endurance with 1 hour/week of speed work or 6-12 hours of slower work/week.

⁷Adjust concentrate feeding rate to desired body condition.

Feeding Recommendations for Growing Ponies

Small Breed Ponies^{1,5,6}

Age (months)	Foal's Weight (lb.)	Growth Rate (lb./day)	Legends Mare & Foal ² (lb./day)	Legends Grow & Perform ³ (lb./day)	Forage ⁴ (lb./day)
0-3	35 – 125	-	0.5 per month of age	-	Free choice
4	147	0.75	1.75 - 2.5	-	2.5 - 3.5
6	189	0.64	2 - 2.5	-	3 - 4.5
12	282	0.40	-	2 - 2.5	4.5 - 6
18	341	0.24	-	2 - 2.5	4.5 - 6
24	378	0.15	-	2 - 2.5	4.5 - 6

¹Mature body weight of 440 pounds..

²Legends Mare & Foal is available in textured formula only. Solution is a pelleted formula that can be used.

³Legends Grow & Perform can replace Legends Mare & Foal at 12 months of age.

⁴Forage includes baled hay, hay cubes, chopped hay and pasture and should be at least 8% crude protein.

⁵Adjust feeding rates to maintain proper growth rate and body condition.

⁶Recommendations based on 70% of NRC₂₀₀₇ Digestible Energy requirements.

Medium Breed Ponies^{1,5,6}

Age (months)	Foal's Weight (lb.)	Growth Rate (lb./day)	Legends Mare & Foal ² (lb./day)	Legends Grow & Perform ³ (lb./day)	Forage ⁴ (lb./day)
0-3	55 – 190	-	0.75 per month of age	-	Free choice
4	222	1.1	2.5 - 3.5	-	4 - 5.5
6	286	1.0	3 - 3.5	-	5.5 - 6
12	425	0.6	-	3.5 – 4	6.5 - 8
18	513	0.4	-	3.5 - 4.5	8 - 10
24	568	0.2	-	3 – 4	9 - 11

¹Mature body weight of 660 pounds..

²Legends Mare & Foal is available in textured formula only. Solution is a pelleted horse feed that can be used.

³Legends Grow & Perform can replace Legends Mare & Foal at 12 months of age.

⁴Forage includes baled hay, hay cubes, chopped hay and pasture and should be at least 8% crude protein.

⁵Adjust feeding rates to maintain proper growth rate and body condition.

⁶Recommendations based on 70% of NRC₂₀₀₇ Digestible Energy requirements.

Large Breed Ponies^{1,5,6}

Age (months)	Foal's Weight (lb.)	Growth Rate (lb./day)	Legends Mare & Foal ² (lb./day)	Legends Grow & Perform ³ (lb./day)	Forage ⁴ (lb./day)
0-3	70 – 250	-	0.95 per month of age	-	Free choice
4	297	1.5	3 – 4	-	5 - 6.5
6	381	1.3	3.5 - 4.5	-	6 - 7.5
12	565	0.8	-	5 - 6	8 - 10
18	682	0.5	-	5 - 6	9 - 12
24	755	0.3	-	5 - 5.5	9 - 12

¹Mature body weight of 880 pounds..

²Legends Mare & Foal is available in textured formula only. Solution is a pelleted horse feed that can be used.

³Legends Grow & Perform can replace Legends Mare & Foal at 12 months of age.

⁴Forage includes baled hay, hay cubes, chopped hay and pasture and should be at least 8% crude protein.

⁵Adjust feeding rates to maintain proper growth rate and body condition.

⁶Recommendations based on 70% of NRC₂₀₀₇ Digestible Energy requirements.

Feeding Recommendations for Mature Ponies in Show and Performance Activities

Small Breed Ponies^{1,2,5}

Activity Level	Triple Crown Lite Formula ⁶ (lb./day)	Legends Show & Pleasure or Triple Crown Low Starch ³ (lb./day)	Legends Performance or Triple Crown Complete or 14% Performance (lb./day)	Forage ⁴ (lb./day)
Maintenance	0.75 – 1.0	-	-	4 – 6
Light ⁵	0.75 – 1.0	-	-	6 – 8
Moderate ⁵	-	1 – 2	1 – 2	6 – 8
Heavy ⁵	-	2 – 3	2 – 3	6 – 8

¹Recommendations are based on mature body weight of 440 pounds and 70% of NRC₂₀₀₇ Digestible Energy requirements.

²Adjust feeding rates to maintain proper body condition.

³Legends Show & Pleasure and Legends Performance are both available in textured and pelleted formulas.

⁴Forage includes baled hay, hay cubes, chopped hay and pasture (minimum 8% crude protein).

⁵Light activity is 1-3 hours/week, moderate activity is 3-5 hours/week and heavy activity is 4-5 hours/week.

⁶If hay is below 8% crude protein, switch to Triple Crown 30% Supplement and reduce feeding rate by 50%.

Medium Breed Ponies^{1,2,5}

Activity Level	Triple Crown Lite Formula ⁶ (lb./day)	Legends Show & Pleasure or Triple Crown Low Starch ³ (lb./day)	Legends Performance or Triple Crown Complete or 14% Performance (lb./day)	Forage ⁴ (lb./day)
Maintenance	1.0 - 1.25	-	-	7 – 9
Light ⁵	1.0 - 1.25	-	-	9 – 11
Moderate ⁵	-	1 – 2	1 – 2	9 – 11
Heavy ⁵	-	2 – 3	2 – 3	9 - 11

¹Recommendations are based on mature body weight of 660 pounds and 70% of NRC₂₀₀₇ Digestible Energy requirements.

²Adjust feeding rates to maintain proper body condition.

³Legends Show & Pleasure and Legends Performance are both available in textured and pelleted formulas.

⁴Forage includes baled hay, hay cubes, chopped hay and pasture (minimum 8% crude protein).

⁵Light activity is 1-3 hours/week, moderate activity is 3-5 hours/week and heavy activity is 4-5 hours/week.

⁶If hay is below 8% crude protein, switch to Triple Crown 30% Supplement and reduce feeding rate by 50%.

Large Breed Ponies^{1,2,5}

Activity Level	Triple Crown Lite Formula ⁶ (lb./day)	Legends Show & Pleasure or Triple Crown Low Starch ³ (lb./day)	Legends Performance or Triple Crown Complete or 14% Performance (lb./day)	Forage ⁴ (lb./day)
Maintenance	1.0 - 1.5	-	-	10 – 12
Light ⁵	1.0 - 1.5	-	-	12 – 14
Moderate ⁵	-	2 – 3	2 – 3	12 – 14
Heavy ⁵	-	3 – 4	3 – 4	12 – 14

¹Recommendations are based on mature body weight of 880 pounds and 70% of NRC₂₀₀₇ Digestible Energy requirements.

²Adjust feeding rates to maintain proper body condition.

³Legends Show & Pleasure and Legends Performance are both available in textured and pelleted formulas.

⁴Forage includes baled hay, hay cubes, chopped hay and pasture and should be at least 8% crude protein.

⁵Light activity is 1-3 hours/week, moderate activity is 3-5 hours/week and heavy activity is 4-5 hours/week.

⁶If hay is below 8% crude protein, switch to Triple Crown 30% Supplement and reduce feeding rate by 50%.

Feeding Recommendations for Mature Donkeys^{1,2,3,4}

Category	Body Weight (lb.)	Grass or Mixed Hay (lb./day)	Triple Crown Lite Formula (lb./day when fed with hay)	Legends Grow & Perform, Solution, Triple Crown Low Starch or Triple Crown TLC (lb./day when fed with hay)
Maintenance	250	3.5 to 4.5	0.25	-
	350	5.5 to 6.5	0.35	-
	450	7.5 to 8.5	0.45	-
	550	8.5 to 10	1.1	-
	650	10 to 12	1.3	-
	750	12 to 14	1.5	-
	850	13 to 15	1.7	-
	950	15 to 17	1.9	-
Show/Performance	250	4 to 5	-	1.25 to 2
	350	5 to 7	-	1.75 to 2.5
	450	7 to 9	-	2.25 to 3
	550	9 to 11	-	2.75 to 3.5
	650	11 to 13	-	3.25 to 4
	750	12 to 15	-	3.75 to 4.5
	850	15 to 17	-	4.25 to 5
	950	17 to 19	-	4.75 to 6

¹Recomendations are based on 70% of NRC₂₀₀₇ Digestible Energy requirements.

²Adjust feeding rates to maintain proper body condition.

³Forage includes baled hay, hay cubes, chopped hay and pasture and should be at least 8% crude protein.

⁴If hay is below 8% crude protein, switch to Triple Crown 30% Supplement and reduce feeding rate by 50%.

Feeding Recommendations for Miniature Horses^{1,4}

Life Stage	Category	Body Weight (lb.)	Hay (lb./day)	Triple Crown Lite Formula (lb./day when fed with hay) ³	Triple Crown 30% Supplement (lb./day when fed with hay)	Legends Mare & Foal or Legends Grow & Perform or Solution ² (lb./day when fed with hay)
Pleasure	Maintenance	100	1 to 2	0.2	0.1	0.3
		200	2 to 3	0.3	0.2	0.6
		300	3 to 4	0.5	0.3	1.1
Performance		100	1.5 to 2	-	-	0.6
		200	2 to 3	-	-	1.2
		300	3 to 4	-	-	1.9
Mare	Open/Pregnant to 8 months	100	1 to 2	0.2	0.1	0.3
		200	2 to 3	0.3	0.2	0.6
		300	3 to 4	0.5	0.3	1.1
		100	1 to 2	-	0.1	0.5
		200	2 to 3	-	0.2	1.0
		300	3 to 4	-	0.3	1.5
	Lactation	100	1.5 to 2	-	-	1.2
		200	2 to 3	-	-	2.3
		300	3 to 4	-	-	3.4
Stallion	Breeding	100	1 to 12	-	0.1	0.6
		200	2 to 3	-	0.2	1.2
		300	3 to 4	-	0.3	1.9
	Non-Breeding	100	1 to 2	0.2	-	0.3
		200	2 to 3	0.3	-	0.6
		300	3 to 4	0.5	-	1.1
Growing	Nursing Foal	15-40	Free Choice	-	-	0.25 per month of age
		60	0.6	-	-	1.0
		80	0.8	-	-	1.2
	Weanling	100	1 to 1.5	-	-	1.3
		120	1 to 1.5	-	-	1.4
		140	1 to 1.75	-	-	1.5
	Yearling	160	1 to 2	-	-	1.6
		180	2 to 2.5	-	-	1.5

¹Recommendations for mature horse weight of 200 pounds.

²Adjust amount of hay and feed for desired body condition or growth rate, recommendations are for feeding only one of the indicated products per horse, Triple Crown Lite Formula, Triple Crown 30% Supplement or Legends Grow & Perform, Legends Mare & Foal or Southern States Solution.

³Switch to Triple Crown 30% Supplement from Triple Crown Lite Formula if hay crude protein is less than 8%.

⁴Recommendations based on 70% of NRC₂₀₀₇ Digestible Energy requirements.

Management Considerations for Miniature Horses

1. Because of their small size, miniature horses are easy to overfeed and this can cause obesity. Obesity in horses can cause founder, decreased performance and decreased reproductive efficiency.
2. Feed according to recommendations by weighing your hay and feed to prevent overfeeding and obesity.
3. Feed at regular times, at least twice daily in equal amounts; don't feed more than 0.5% of body weight per meal for any feed products.
4. Do not feed hay or feed products on a free-choice basis.
5. Have clean, fresh water and a white salt block available at all times.
6. Do not provide EquiMin Horse Mineral or other mineral supplements available free-choice to prevent formation of enteroliths or intestinal stones.
7. Maintain an effective parasite control, dental and vaccination program and make any changes in feed or hay over a period of 7 to 10 days.
8. Using a kitchen measuring cup for pelleted horse feeds, $\frac{3}{4}$ cup = $\frac{1}{4}$ pound, $1\frac{1}{2}$ cups = $\frac{1}{2}$ pound and 3 cups = 1 pound.
9. Miniature horses should be fed 1% to 2% of their body weight daily to meet requirements for maintenance (example: 200-lb miniature horse fed 2 to 3 pounds of grain and hay daily). Feed good quality hay at a minimum of 1% of body weight daily plus a horse feed supplement or fortified feed to meet nutritional requirements.
10. Miniature horses are more prone to dental issues including retained caps for growing horses, abnormal biting patterns and more frequent dental floating requirements, so consult with a knowledgeable veterinarian/dentist.
11. Weight tapes were not designed for miniature horses so use a tape with Units in inches instead of pounds and use one of the two following equations: $(\text{Heart Girth} \times 9.36) + (\text{Body Length} \times 5.01) - 348.53 = \text{Body Weight (pounds)}$ or $(\text{Heart Girth} \times 13.18) - 326.07 = \text{Body Weight (pounds)}$.

Soluble Carbohydrate Values of Southern States Horse Feeds*

Horse Feed and Form	WSC	ESC	Starch	Starch + ESC	NSC
Select 12 Textured	8.9%	3.1%	14.9%	18.0%	23.8%
Select 12 Pelleted	5.5%	3.6%	25.5%	29.1%	31.0%
Southern States Reliance Textured	5.7%	4.7%	27.6%	32.3%	33.3%
Southern States Reliance Pelleted	12.2%	6.7%	9.9%	16.6%	22.1%
Southern States 11-Six Textured	7.5%	5.3%	31.3%	36.6%	38.8%
Southern States 11-Six Pelleted	6.4%	3.2%	21.1%	24.3%	27.5%
Southern States All Grain Textured	8.1%	6.1%	41.2%	47.3%	49.3%
Southern States Hay Stretcher Pelleted	4.2%	4.2%	11.8%	16.0%	16.5%
Southern States Solution Pelleted	5.8%	4.5%	16.0%	20.5%	21.8%
Southern States 14-Six Textured	11.3%	7.2%	12.0%	19.2%	23.3%
Southern States Triple 10 Textured	10.4%	6.4%	15.5%	21.9%	25.9%
Legends Show & Pleasure Textured	8.9%	6.9%	22.5%	29.4%	31.4%
Legends Show & Pleasure Pelleted	2.8%	2.8%	23.4%	26.2%	29.1%
Legends Grow & Perform Textured	9.0%	7.0%	26.0%	33.0%	35.0%
Legends Grow & Perform Pelleted	5.7%	4.1%	19.4%	23.5%	25.1%
Legends Mare & Foal Textured	9.5%	7.6%	15.3%	22.9%	24.8%
Legends Senior Pelleted/Extruded	8.3%	4.2%	7.9%	12.1%	16.2%
Legends Performance Textured	8.6%	5.8%	19.9%	25.7%	28.5%
Legends Performance Pelleted	6.4%	3.7%	6.5%	10.2%	12.9%
Legends Racing Textured	11.5%	7.5%	14.1%	21.6%	25.6%
Legends Fortified Pelleted Rice Bran Extruded	4.6%	4.6%	17.4%	22.0%	22.0%
Legends Omega Plus Fat Supplement Extruded	8.3%	1.1%	20.7%	21.8%	29.0%
Triple Crown 14% Performance Textured	6.3%	5.6%	31.8%	37.4%	38.1%
Triple Crown Complete Textured	8.8%	8.8%	11.8%	20.6%	20.6%
Triple Crown Senior Textured	5.3%	5.3%	6.4%	11.7%	11.7%
Triple Crown Growth Textured	8.3%	7.8%	5.6%	13.4%	13.9%
Triple Crown Low Starch Pelleted	3.1%	3.1%	10.4%	13.5%	13.5%
Triple Crown TLC Pelleted	8.4%	5.0%	8.3%	13.3%	16.7%
Triple Crown Lite Pelleted	4.8%	4.8%	4.5%	9.3%	9.3%
Triple Crown 30% Supplement Pelleted	8.0%	8.0%	1.8%	9.8%	9.8%
Triple Crown Safe Starch Forage Chopped	7.2%	4.3%	1.8%	6.1%	9.0%
Triple Crown Grass Forage Chopped	9.7%	8.1%	4.5%	12.6%	14.2%
Triple Crown Alfalfa Forage Chopped	9.9%	8.0%	4.7%	12.7%	14.6%

*Values determined by Equi-Analytical Laboratories, Ithaca, NY and reported on as sampled or as fed basis. WSC is water-soluble carbohydrates. ESC is ethanol-soluble carbohydrates or simple sugars, NSC is nonstructural carbohydrates, NSC = Starch + WSC, and fructan sugars = WSC - ESC. Select horse feeds with low Starch + ESC (simple sugars) values to prevent laminitis, excitable behavior, tying up diseases (PSSM, EPSM and RER), Developmental Orthopedic Disease (DOD) in growing horses, calmer behavior, reduced insulin resistance for Equine Metabolic Syndrome and Equine Cushing's Disease. Also, forages with high NSC values (due to fructan sugars) are more likely to cause laminitis. All feeds have fixed-ingredient formulas and values reflect an average analysis of one or more feed samples.

Density Measurements of Southern States Horse Feeds

Horse Feed and Form	Pounds per Dry US Quart
Triple Crown Growth Formula <i>Textured</i>	1.11
Triple Crown Lite Formula <i>Pelleted</i>	1.42
Triple Crown 30% Supplement <i>Pelleted</i>	1.47
Triple Crown Low Starch Formula <i>Pelleted</i>	1.31
Triple Crown TLC <i>Pelleted</i>	1.20
Triple Crown Senior Formula <i>Textured</i>	1.08
Triple Crown Complete Formula <i>Textured</i>	1.01
Triple Crown 14% Performance <i>Textured</i>	1.08
Legends Mare & Foal <i>Textured</i>	1.40
Legends Performance <i>Pelleted</i>	1.48
Legends Performance <i>Textured</i>	1.70
Legends Show & Pleasure <i>Pelleted</i>	1.64
Legends Show & Pleasure <i>Textured</i>	1.74
Legends Grow & Perform <i>Pelleted</i>	1.52
Legends Grow & Perform <i>Textured</i>	1.46
Legends Racing <i>Textured</i>	1.39
Legends Senior Pelleted/Extruded	1.30
Legends Fortified Pelleted Rice Bran <i>Extruded</i>	1.38
Legends Omega Plus <i>Extruded</i>	1.38
Southern States Reliance <i>Pelleted</i>	1.56
Southern States Reliance <i>Textured</i>	1.28
Southern States 11-Six <i>Pelleted</i>	1.50
Southern States 11-Six <i>Textured</i>	1.32
Southern States All Grain <i>Textured</i>	1.36
Southern States Hay Stretcher <i>Pelleted</i>	1.46
Southern States Solution <i>Pelleted</i>	1.50
Southern States 14-Six <i>Textured</i>	1.36
Southern States Triple 10 <i>Textured</i>	1.40
Select <i>Pelleted</i>	1.50
Select <i>Textured</i>	1.38

Digestible Energy Values of Southern States Horse Feeds

Horse Feed and Form	Digestible Energy per Pound (as fed basis)
Triple Crown Growth Formula <i>Textured</i>	1,568 kcal
Triple Crown Lite Formula <i>Pelleted</i>	1,150 kcal
Triple Crown 30% Supplement <i>Pelleted</i>	1,266 kcal
Triple Crown Low Starch Formula <i>Pelleted</i>	1,428 kcal
Triple Crown TLC <i>Pelleted</i>	1,550 kcal
Triple Crown Senior Formula <i>Textured</i>	1,548 kcal
Triple Crown Complete Formula <i>Textured</i>	1,700 kcal
Triple Crown 14% Performance <i>Textured</i>	1,708 kcal
Triple Crown Safe Starch Forage <i>Chopped</i>	1,100 kcal
Triple Crown Omega Max <i>Extruded</i>	2,050 kcal
Legends Mare & Foal <i>Textured</i>	1,455 kcal
Legends Performance <i>Pelleted</i>	1,596 kcal
Legends Performance <i>Textured</i>	1,638 kcal
Legends Show & Pleasure <i>Pelleted</i>	1,459 kcal
Legends Show & Pleasure <i>Textured</i>	1,469 kcal
Legends Grow & Perform <i>Pelleted</i>	1,446 kcal
Legends Grow & Perform <i>Textured</i>	1,464 kcal
Legends Senior <i>Pelleted/Extruded</i>	1,355 kcal
Legends Racing <i>Textured</i>	1,381 kcal
Legends Sales Prep <i>Textured</i>	1,472 kcal
Legends Fortified Pelleted Rice Bran <i>Extruded</i>	1,490 kcal
Legends Omega Plus Fat Supplement <i>Extruded</i>	1,786 kcal
Southern States Reliance <i>Pelleted</i>	1,351 kcal
Southern States Reliance <i>Textured</i>	1,389 kcal
Southern States 11-Six <i>Pelleted</i>	1,459 kcal
Southern States 11-Six <i>Textured</i>	1,471 kcal
Southern States All Grain <i>Textured</i>	1,489 kcal
Southern States Triple 10 <i>Textured</i>	1,663 kcal
Southern States Solution <i>Pelleted</i>	1,472 kcal
Southern States 14-Six <i>Textured</i>	1,452 kcal
Southern States Hay Stretcher <i>Pelleted</i>	1,176 kcal
Select <i>Pelleted</i>	1,213 kcal
Select <i>Textured</i>	1,222 kcal

Horse Feeding Problems and Solutions Guide

FEEDING PROBLEM	FEEDING SOLUTION
Orphan Foal (birth to 3 months) Allergic to Molasses, Corn, Barley, Oats or Alfalfa	Mare's Match Foal Milk Replacer, Mare's Match Foal Pellets Triple Crown Low Starch Formula
Allergic to Wheat Products Rescue/Starved Horse	All Grain (contains no wheat products) Legends Senior, Triple Crown Senior Formula, Triple Crown Low Starch Formula, Triple Crown TLC, Triple Crown Alfalfa Cubes, Triple Crown Chopped Alfalfa Forage, Southern States Hay Stretcher
HYPP (Hyperkalemic Periodic Paralysis) Excitable Behavior	Triple Crown Low Starch Formula (only 0.75% potassium) Legends Senior, Legends Performance Pelleted, Triple Crown Low Starch Formula, Triple Crown TLC, Triple Crown Senior Formula
Bolting Feed (add to feed to slow intake)	Triple Crown Chopped Grass Forage, Triple Crown Chopped Alfalfa Forage, Triple Crown Alfalfa Cubes, Triple Crown Alfalfa/Timothy Cubes
Tying Up Diseases, Shivers & Stringhalt	Legends Senior, Legends Performance Pelleted, Triple Crown Senior Formula, Triple Crown TLC, Triple Crown Safe Starch Forage
Colic/Founder/Laminitis	Triple Crown Low Starch Formula, Triple Crown Safe Starch Formula, Triple Crown Lite Formula, Triple Crown TLC, Triple Crown Senior Formula, Legends Senior, Legends Performance Pelleted
DOD/Physitis (weanling to yearling)	Triple Crown 30% Supplement (1.5-2 lbs/day) and limited hay feeding (1.0-1.2% BW/day)
Cushing's Disease, Insulin Resistance, Metabolic Syndrome, Diabetes	Triple Crown Low Starch Formula, Triple Crown Lite Formula, Triple Crown Senior Formula, Triple Crown TLC, Triple Crown Safe Starch Forage, Legends Senior, Legends Performance Pelleted
Sales Preparation	Legends Fortified Pelleted Rice Bran, Legends Omega Plus, Legends Grow & Perform Pelleted and Textured, Triple Crown Omega Max, Triple Crown Growth Formula, Triple Crown 14% Performance Formula, Legends Sales Prep (KY only)
Obese/Easy Keeper/IR	Triple Crown Lite Formula, Triple Crown 30% Supplement
Respiratory Issues - Heaves, COPD, IAD, RAO	Southern States Hay Stretcher, Triple Crown Chopped Alfalfa Forage, Triple Crown Chopped Grass Forage, Triple Crown TLC, Triple Crown Safe Starch Forage, Triple Crown Alfalfa Cubes, Triple Crown Alfalfa-Timothy Cubes, Legends Racing, Legends Senior, Triple Crown Senior Formula
Underweight/Hard Keeper	Legends Performance Pelleted and Textured, Legends Omega Plus, Legends Fortified Pelleted Rice Bran, Triple Crown TLC, Triple Crown 14% Performance Formula, Triple Crown Complete Formula
Post Surgery, Digestive Complications/Challenges	Triple Crown Senior Formula, Triple Crown TLC, Legends Senior, Legends Performance Pelleted, Southern States Hay Stretcher
Dental Issues (can't eat hay)	Triple Crown Senior Formula, Triple Crown Low Starch Formula, Legends Senior, Southern States Hay Stretcher, Triple Crown TLC, Legends Performance Pelleted
Gastric Ulcers	Triple Crown Alfa-Lox Forage, Triple Crown Chopped Alfalfa Forage, Triple Crown Chopped Grass Forage, Triple Crown Safe Starch Forage, Triple Crown Low Starch, Legends Performance Pelleted
Colonic Ulcers	Triple Crown Senior Formula, Triple Crown Low Starch, Triple Crown TLC, Legends Performance Pelleted, Legends Senior, Southern States Hay Stretcher