Feeding the Horse with Cushing’s Disease

Dr. Martin Adams
What is Equine Cushing’s Disease?

- Disorder of pituitary gland.
- Results in hormonal imbalances with variety of symptoms.
- Occurs in middle-aged to older horses with average age of 20 years.
- Without treatment, most horses must be euthanized due to laminitis, recurrent foot abscesses or complications from infections.
Major Symptoms

- Long, curly hair coat that won’t shed in spring.
- Lethargy and poor athletic performance.
- Excessive sweating.
- Chronic, recurrent laminitis.
- Muscle wasting, especially along top line.
- Delayed wound healing and increased susceptibility to infections.
Major Symptoms (continued)

- Abnormal fat distribution: accumulations in the crest of neck, along tail head, sheath and above eyes.

- Consumption of large amounts of water and passage of large amounts of water.

- Infertility in mares and stallions.
Nutrition Recommendations

• Feed a low non-structural carbohydrate (NSC) diet, <20% NSC for most Cushing’s horses, <10% NSC for sensitive, problem horses, especially ponies and miniature horses.
• Feed to maintain proper body condition (5.0), prevent obesity.
• Provide 150% of daily NRC levels for calcium, phosphorus, copper, magnesium, zinc, and selenium, also can increase magnesium and/or chromium to the following levels:
  – Provide 2 grams magnesium per 100-lb of body weight daily.
  – Provide 1 mg chromium per 100-lb of body weight daily.
• Reducing body condition, low NSC diet and magnesium supplementation appear to have the greatest effects in reducing symptoms such as cresty neck and other fat deposits, decreasing high blood sugar and insulin, and reducing founder or lameness.
Non-Structural Carbohydrates

- NSC = sugar and starch present in grain and forage.
- Testing for NSC components is new, few values available for forages and feedstuffs.
- Sugars and starches are digested in small intestine first, cause glycemic response (rise in blood sugar and insulin levels).
- Most legume and grass hays will have an NSC content of 10 to 15%.
- Avoid small-grain hays (oat, barley, etc.) and ryegrass, fescue and bromegrass hays, as they can have an NSC content of 20% or more.
Non-Structural Carbohydrate Analysis

- Southern States has NSC values for all horse feeds analyzed by an independent laboratory.
- Sugar and starch values for Reliance, Legends and Triple Crown horse feeds are available.
- Go to www.equssource.com for more information.
**Sugar, Starch and NSC Content of Selected Southern States Horse Feeds**

<table>
<thead>
<tr>
<th>Horse Feed</th>
<th>Sugar</th>
<th>Starch</th>
<th>NSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triple Crown Senior Formula</td>
<td>10.7%</td>
<td>5.1%</td>
<td>15.7%</td>
</tr>
<tr>
<td>Triple Crown Lite</td>
<td>6.4%</td>
<td>9.5%</td>
<td>15.9%</td>
</tr>
<tr>
<td>Triple Crown 12% Supplement</td>
<td>5.3%</td>
<td>24.4%</td>
<td>29.7%</td>
</tr>
<tr>
<td>Triple Crown Low Starch</td>
<td>5.9%</td>
<td>9.1%</td>
<td>15.0%</td>
</tr>
<tr>
<td>Triple Crown Safe Starch Forage</td>
<td>5.1%</td>
<td>3.7%</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

*Values determined at Equi-Analytical Laboratories, Ithaca, NY and reported on as fed basis.*
Magnesium and Chromium Sources

- Magnesium available in inorganic and organic (chelated) forms.
  - Magnesium oxide = 54.9% magnesium: 1 ounce (28 grams) = 15 grams of magnesium.
  - Magnesium sulfate (Epsom salt) = 9.6% magnesium: 1 ounce = 2.6 grams of magnesium.

- Chromium available in supplements in organic forms.
  - Metaboleeze® (5 mg chromium per ounce).
  - Quiessence® (5 g magnesium & 1.25 mg chromium per ounce).
  - Remission® (6 g magnesium & 14 mg chromium per ounce).
Feeding Example #1 for Pony with Cushing’s Disease

- 500-lb Pony at maintenance fed 8.5 pounds of hay and 1 pound of Triple Crown Lite daily.
- Magnesium daily NRC dietary requirement: 3.4 grams. (target of 10 g magnesium and 5 mg chromium)
- Magnesium content of 8.5 pounds of grass hay: 8.5 pounds x .08% = 3.1 grams.
- Magnesium content of 1 pound of Triple Crown Lite: 1 pound x .5% = 2.27 grams.
- 1 ounce of Quiessence® daily = 5.0 grams magnesium.
- Total dietary magnesium = 10.37 grams.
- 1 ounce of Metaboleeze® daily.
- Total dietary chromium = 6.25 milligrams.
Feeding Example #2 for Pony with Cushing’s Disease

• 500-lb Pony at maintenance fed 8.0 pounds of hay and 1 pound of Triple Crown 12% Supplement daily.

• Magnesium daily NRC dietary requirement: 3.4 grams. (target of 10 g magnesium and 5 mg chromium)

• Magnesium content of 8.5 pounds of grass hay: 8.0 pounds x .08% = 2.9 grams.

• Magnesium content of 1 pound of Triple Crown 12% Supplement: 1 pound x 2.25% = 10.2 grams.

• Total daily dietary magnesium = 13.1 grams.

• 1 ounce of Metaboleeze® daily.

• Total daily dietary chromium = 5 milligrams.
Feeding Example #3 for Pony with Cushing’s Disease

• 500-lb Pony at maintenance fed 8.0 pounds Triple Crown Safe Starch Forage.
• Magnesium daily NRC dietary requirement: 3.4 grams. (target of 10 g magnesium and 5 mg chromium)
• Magnesium content of 8.0 pounds Triple Crown Safe Starch Forage: 8.0 pounds x .50% = 18.2 grams
• Total daily dietary magnesium = 18.2 grams.
• 1 ounce of Metaboleeze® daily.
• Total daily dietary chromium = 5 milligrams.
Feeding Example #4 for Horse with Cushing’s Disease

- 1000-lb Horse at maintenance fed 15.5 pounds of hay and 2 pounds of Triple Crown Lite daily.
- Magnesium daily NRC dietary requirement: 6.8 grams. (target of 20 g magnesium and 10 mg chromium)
- Magnesium content of 15.5 pounds of grass hay: 15.5 pounds x .08% = 5.6 grams.
- Magnesium content of 2 pounds of Triple Crown Lite: 2 pounds x .5% = 4.5 grams.
- 2 ounces of Quiessence® daily = 10 mg magnesium.
- Total daily dietary magnesium = 20.1 grams.
- 0.5 ounce of Metaboleeze® daily.
- Total dietary chromium = 5 milligrams.
Feeding Example #5 for Horse with Cushing’s Disease

- 1000-lb Horse at maintenance fed 14.5 pounds of hay and 2 pounds of Triple Crown 12% Supplement daily.
- Magnesium daily NRC dietary requirement: 6.8 grams. (target of 20 g magnesium and 10 mg chromium)
- Magnesium content of 14.5 pounds of grass hay: 14.5 pounds x 0.08% = 5.3 grams.
- Magnesium content of 2 pounds of Triple Crown 12% Supplement: 1.5 pounds x 2.25% = 15.3 grams.
- Total daily dietary magnesium = 20.6 grams.
- Two ounces of Metaboleeze® daily.
- Total daily dietary chromium = 10 milligrams.
Feeding Example #6 for Horse with Cushing's Disease

• 1000-lb Horse at light activity fed 12.0 pounds of hay and 5.0 pounds of Triple Crown Low Starch daily.
• Magnesium daily NRC dietary requirement: 8.6 grams. (target of 20 g magnesium and 10 mg chromium)
• Magnesium content of 12.0 pounds of grass hay: 12.0 pounds x .08% = 4.3 grams.
• Magnesium content of 5 pounds of Triple Crown Low Starch: 2 pounds x .5% = 11.4 grams.
• One ounce of Quiessence® and two ounces of Metaboleeze® daily.
• Total dietary magnesium = 20.7 grams.
• Total dietary chromium = 11.25 milligrams.
Feeding Example #7 for Horse with Cushing’s Disease

- 1000-lb Horse at light activity fed 12.0 pounds of hay, 4.5 pounds of Triple Crown Low Starch and 0.5 pounds of Triple Crown 12% Supplement daily.
- Magnesium daily NRC dietary requirement: 8.6 grams. (target of 20 g magnesium and 10 mg chromium)
- Magnesium content of 12.0 pounds of grass hay: 12.0 pounds x 0.08% = 4.3 grams.
- Magnesium content of 4.5 pounds of Triple Crown Low Starch: 4.5 pounds x 0.5% = 10.2 grams.
- Magnesium content of 0.5 pounds of Triple Crown 12% Supplement: 0.5 pounds x 2.25% = 5.1 grams.
- Total daily dietary magnesium = 19.6 grams.
- Two ounces of Metaboleeze® daily.
- Total daily dietary chromium = 10 milligrams.
Feeding Example #8 for Older Horse with Cushing’s Disease

• 900-lb Older Horse (30 years old) needing to gain weight and not worked fed a daily diet of 10.0 pounds of Triple Crown Senior and 5.0 pounds of Triple Crown Alfalfa Cubes will support a gain of 0.75 pounds per day.

• Magnesium daily NRC dietary requirement: 6.8 grams.
  (target of 20 g magnesium and 10 mg chromium)

• Magnesium content of 10.0 pounds of Triple Crown Senior: 10.0 pounds x .37% = 16.8 grams.

• Magnesium content of 5 pounds of Triple Crown Alfalfa Cubes: 5 pounds x 0.25% = 5.6 grams.

• Total daily dietary magnesium = 22.4 grams.

• Two ounces of Metaboleeze® daily.

• Total dietary chromium = 10 milligrams.