Nutrition for the Metabolic/Cushingoid Horse

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Goals

- What are PPID and EMS?
- What is their link to IR?
- How is IR linked to laminitis?
- What are the basics of equine nutrition?
- How do we feed these “metabolic” horses?
Endocrine Disorders Requiring Dietary Management

• Pituitary Pars Intermedia Dysfunction (PPID) *also known as* Equine Cushing’s Disease

• Equine Metabolic Syndrome (EMS)

** Both disorders are linked to laminitis!**
Equine Cushing’s Disease

- Pituitary gland in brain is responsible for normal metabolic functions.
- It signals adrenal glands (near kidneys) to produce cortisol.
- With PPID, excessive cortisol is produced.
Equine Cushing’s Disease

Clinical signs include:

- Excessive and/or curly haircoat (hirsiutism)
- Excessive drinking and urination
- Immunosuppression/recurrent infections
- Chronic laminitis
- Change in body condition (muscle wasting)
- Can involve Insulin Resistance
Equine Metabolic Syndrome

A condition in horses that involves:

- Insulin Resistance
- Laminitis
- Regional fat deposition (creasy neck, fat pads, etc.)
Insulin Resistance (IR)

Insulin:

- Hormone responsible for maintaining normal blood glucose.
- Released by pancreas when blood glucose is high, stimulating the body’s cells to take up glucose from the blood.
- IR is failure of tissues to respond to insulin.
- Similar to Type 2 Diabetes in people.
Insulin Resistance

- IR plays a role in both PPID and EMS.
- IR affects the threshold for laminitis.
- Proper nutrition is key to managing IR.
Nutrition Basics

• Horses are designed to graze throughout the day.

• Grasses & forages are the primary source of nutrition.

• Site of digestion in the horse’s gut is very important.
Nutrition 101

- Stomach: 8-19 quarts
- Small Intestine: 70 ft., 68 quarts
- Cecum: (On right side of abdominal cavity), 4 ft., 28-36 quarts
- Small Colon: 10-12 ft., 16 quarts
- Large Colon: 10-12 ft., 86 quarts
- Esophagus: 4-5 ft.
- Rectum: 1 ft.
Goals for Managing IR

- Reduce body fat in obese animals to improve insulin sensitivity
- Avoid feeds that exacerbate IR
- Lower risk of laminitis by improving insulin sensitivity through weight loss, diet and exercise
- Avoid sudden changes in bacterial flora that might trigger laminitis
Basic Nutrition

- Mature horse eats 1.5-2% of its body weight per day.
- At least ½ of this should be roughage.
- Average 1000# horse should get 15-20 # of hay per day (approx. 5-7 flakes).
- Weigh your flakes!
Basic Nutrition

• Forage is the cornerstone of the diet.
• Concentrates are meant to supplement hay.
• Hay analysis is the only way to know what’s in your hay.
Forages

Two basic types of hay:

Legume hay (alfalfa)  Grass hay (Timothy)
Carbs, Carbs, Carbs!

Structural Carbohydrates
• Originate from the plant cell wall and make up insoluble fiber in the diet.
• Includes cellulose, hemicellulose, ligno-cellulose and lignin.

Non-structural Carbohydrates (NSC’s)
• Come from internal components of plant cell.
• Includes simple sugars (monosaccharides and disaccharides), starches, oligosaccharides such as oligofructoses (fructans), and soluble fiber (gums, mucilages and pectins).
Ideal BCS 4.5 to 5
Obese Horses

• Do not need grain!
• Can get all caloric requirements from hay (1.5-2% of BW) so approx. 15-20 lbs. of hay daily.
• Can feed vitamin/mineral supplement
• Don’t forget exercise!
Avoid Feeds that Exacerbate IR

- Reduce sugar intake (Non-structural carbohydrates)
- Limit rich pasture grass (1-2 hrs/day)
- Employ grazing muzzles
- Should feed <12% NSC hay (verify by analysis)
Avoid Feeds that Exacerbate IR

- Soak hay 30 minutes to 2 hours maximum.
- Feed grains with low non-structural carbohydrates (NSC’s).
- Avoid sugary treats including carrots and apples.
Avoid Feeds that Exacerbate IR

Avoid pasture grass when the plant is storing the most sugars:

• Spring when it is growing
• First drying out during a summer drought
• Rapidly growing after heavy summer rain
• Entering winter dormancy

**Keep IR horses off grass during these dynamic phases!
Feeding the Lean IR Horse

Diet 1:
- Low NSC hay (<12%) with soaked molasses-free beet pulp (0.5 to 1 cup before soaking) and 0.5 cup rice bran oil or corn oil (contains 100g fat) added twice daily
Feeding the Lean IR Horse

Diet 2:
• Low NSC hay (<12%) with a commercial low starch feed substituted for beet pulp
## “Low-Carb” Feeds

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<th>Feed Name</th>
<th>Non-structural Carbohydrate (NSC %)</th>
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<td>Triple Crown Lite</td>
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</table>
Feeding the Lean IR Horse

Diet 3:

• Diet 1 or 2 substituting rice bran for oil.

• Rice bran contains 20% fat. Rec. to feed 1lb. (90g fat) twice daily.
Feeding the IR Horse

• Feed low NSC’s feeds!
• Feed smaller meals more frequently (3-4 times daily) to reduce glycemic response.
• Feed hay 15 to 30 minutes prior to concentrates.
Exercise

• 30 to 45 minutes of walk/trot work is considered LOW level exercise.

• If patients are not currently suffering from laminitis, they should get moderate exercise daily.
Adjunctive Medications

- Horses that cannot exercise or who are severely obese benefit from supplementation with Thyro-L.
- Thyro-L helps to accelerate weight loss and aids in sensitizing cells to insulin.
Summary

• All EMS and some PPID horses will have IR.
• Horses with IR are prone to developing laminitis.
• IR horses must be fed low NSC feeds to avoid triggering laminitis.