

Insulin Dysregulation (ID) and Equine Metabolic Syndrome (EMS)

Equine Metabolic Syndrome (EMS) is a collection of risk factors associated with an increased risk of laminitis and Insulin Dysregulation. Horses with EMS are typically overweight and have “regional adiposity” (cresty neck and fat pads). EMS results from an interaction between genetic and environmental factors (diets high in starches and sugars).

Insulin Dysregulation (ID) is a condition where body tissues fail to respond appropriately to insulin. Diets that are higher in carbohydrates exacerbate this state because they stimulate further insulin production when eaten, which greatly increases the risk of laminitis. Horses with ID commonly also have EMS, but the condition can happen in horses who are thin or appropriate body condition. ID is also often associated with PPID (Equine Cushing’s Disease).

Diagnosis

- It is important to diagnose these conditions to determine the risk of complications such as laminitis or fatty liver.
- **Baseline Insulin:** If this blood test is positive, ID is confirmed. A negative result does not rule out ID because some cases may be missed.
- **Oral Sugar Test:** This test is more accurate and will identify more mild cases of ID, although a negative result can’t rule out ID. It involves taking a baseline blood sample, then administering Karo syrup orally, and then taking another blood sample 60 and/or 90 minutes later.
- **Supplemental Testing:** Triglyceride level, insulin tolerance, glucose, and/or leptin testing may be used in some cases.
- Horses must be fasted from grain for these tests. Hay and grass can be fed normally for a baseline insulin test, but is removed 3-6 hours before the Oral Sugar Test.
- Bloodwork should be re-tested 1-3 months after diagnosis and initiating treatment and should be monitored every 6-12 months thereafter.

Treatment

- **Exercise** will boost metabolism and help with weight loss, as long as the horse is sound.
- **Medications:** these work in different ways to help maintain healthy insulin levels and can be given in combination.
 - **InsulinWise:** This powdered or pelleted supplement is kept in stock at our office.
 - **Metabarol:** This pelleted supplement is available through Equithrive
 - Use our discount code MIAMITOWNEQUINE for **10% off your first order**
 - “Metacare”: Equithrive offers **\$50 rebate** for insulin bloodwork if on Metabarol
 - **Thyro-L:** This powdered medication is kept in stock at our office.
 - Used for 3-6 months to jump-start weight loss if dietary changes are not enough. After weight loss is achieved, it should be slowly tapered and discontinued.
 - True “hypothyroidism” is very rare in horses – this thyroid medication is primarily used for weight loss, which in turn improves metabolic function.
 - **Ertugliflozin:** This liquid medication can be ordered for your horse.
 - Used in horses with dangerously high or refractory insulin levels to rapidly decrease insulin
- **Weight loss:** Overweight horses should be placed on a weight loss diet. They should be fed a total of 1.25-1.5% of body weight (including all feed, hay, and pasture).
- **Dietary Management** is the most important treatment for ID and EMS. See dietary management recommendations on the back of the page.

Dietary Management of ID/EMS

Hay

- We can test your hay for NSC to determine if it's safe (<15% NSC, ideally <10%).
- Soaking hay in cold water for 30-60 minutes will remove much of the sugar if the NSC is unknown. Steaming hay will not remove sugars.
- Hay should be fed in a slow-feed net such as Hay Chix so that it lasts longer to combat boredom.
- **Triple Crown Safe Starch Fortified Forage** is low-calorie, low-NSC (8.7%) all-in-one product.

Pasture

- Without a grazing muzzle, a horse on pasture can consume 1.6% of their body weight in 1 hour! Horses eat grass quickly and efficiently when they know their time will be restricted, so a muzzle is needed to slow down consumption.
- Overgrazed and short pasture is unsafe. The bottom 3 inches of the blade of grass holds most of the sugar, and stressed grass also stores more sugar.
- Fall grass and stressed pasture (common in summer/winter) are just as dangerous as spring grass.
- The safest time to graze is between the 2 hours before sunrise and the 2 hours after sunrise.
- **Grazing Muzzles**
 - GreenGuard: Higher priced but longer lasting. There are inserts sold separately if needed: a more restrictive insert, or a softer plastic insert if you notice wear on the front teeth.
 - Tough-1, Thinline, and Best Friend are other good options, but need to be replaced more frequently (usually every year) as the holes become enlarged.
 - For horses that try to take their muzzle off, choose a muzzle that has extra straps across the front or those that attach to a breakaway halter. The crownpiece of the muzzle can be braided into the mane or attached to a breakaway neck collar.
 - Some horses can develop rub sores. Use fleece to pad the parts that rub.
- **Dry Lot:** A dry lot is a great option to allow for turnout and give horses a break from the grazing muzzle. Some horses with severe metabolic issues need to be kept in a dry lot full-time.

Treats should be limited to small amounts of only low sugar treats such as Equi Treats or Beet-E-Bites

Grain

- Low NSC (starch + sugar) of <15%, the lower the better.
- Ideally, avoid high protein feeds (>30%) that new research indicates may also cause an insulin spike. Many ration balancers such as Essential K are low-calorie and low-NSC, but higher in protein and may be an issue for some horses with Insulin Dysregulation.
- Smaller, frequent meals are best to help decrease the post-meal insulin spike.
- If a grain is fed at lower rate than the label recommendations, an additional vitamin/mineral supplement should be added. This is especially important for horses with restricted hay/pasture/grain.
- **Overweight** or “easy keeper” horses with EMS/ID:
 - Low calorie, low NSC, low/moderate protein feed
 - Vitamin/mineral supplement if not getting a full serving of grain: **NutrientWise from Wiser Concepts, vet code WC23016** (or SmartEssentials or Platinum Performance)
 - Feed as little grain as possible- just enough to get them to eat their supplements (vitamin/mineral, InsulinWise, Metabarol, Thyro-L, etc.)
 - Alternatively, you can mix their supplements with **SafeStarch Forage**. If you feed at least 4 pounds of SafeStarch Forage per day, you will not need to feed a separate vitamin/mineral supplement.
- **Underweight** or “hard keeper” horses with ID:
 - High calorie/high fat, low-NSC, low/moderate protein grain fed per label directions
 - Add a fat supplement such as Cocosoya to gain weight safely
- **Geriatric** horses with ID often need a senior feed due to poor dentition:
 - “Easy keeper” geriatrics: Low calorie, low-NSC, low/moderate protein, high fiber senior feed
 - “Hard keeper” geriatrics: High calorie/high fat, low-NSC, low/moderate protein, high fiber senior feed, add a fat supplement such as Cocosoya to gain weight safely if needed.

Feed Recommendations

Easy Keeper & Metabolic (EMS/ID):						
*If feeding below the minimum recommended feeding rate, add a vitamin/mineral supplement						
Feed	NSC (starch+sugar)	Protein	Fat	Fiber	Calories kcal/lb	Feeding rate/ 1000 lb
Triple Crown Lite	10.10%	12%	3%	20%	1,150	2-4 lb
Hygain Meta Safe	6.50%	15%	4%	35%	810	1+ lb
Hygain Zero	5.50%	15%	4%	35%	800	3.5+ lb
Sentinel Care Carb-Guard	10.00%	12%	8%	25%	1,410	4+ lb
Purina WellSolve L/S	11.00%	12%	6%	23%	1,200	6+ lb
Purina Omega Match	12.50%	14%	9%	20%	1,250	2-2.5 lb
Purina WellSolve W/C	13.00%	12%	1%	26%	900	3.5+ lb
Nutrena SafeChoice Special Care	13.00%	14%	7%	17%	1,320	2.5+ lb
Tribute Kalm N EZ	13.50%	14%	8%	20%	1,470	4+ lb
Hard Keeper & Metabolic (EMS/ID):						
Feed	NSC (starch+sugar)	Protein	Fat	Fiber	Calories kcal/lb	Feeding rate/ 1000 lb
Triple Crown Senior Gold	11.40%	15%	13%	18%	1,800	6+ lb
Triple Crown Senior Active+	12.90%	14%	12%	16%	1,535	5+ lb
Triple Crown Senior	14.70%	14%	10%	17%	1,546	6+ lb
Sentinel XT Pro	10.00%	14%	10%	17%	1,480	4.5+ lb
Sentinel LifeTime LT	14.50%	14%	10%	20%	1,500	4.5+ lb
Sentinel Performance LS	14.00%	12%	12%	20%	1,565	4.0+
Tribute Kalm N EZ	13.50%	14%	8%	20%	1,470	4+ lb
Sentinel Care Carb-Guard	10.00%	12%	8%	25%	1,410	4+ lb
Easy Keeper Senior & metabolic (EMS/ID)						
Feed	NSC (starch+sugar)	Protein	Fat	Fiber	Calories kcal/lb	Feeding rate/ 1000 lb
Seniority Low NSC	10%	14%	6%	22%	1,270	4+ lb
Hard Keeper Senior & metabolic (ID)						
Feed	NSC (starch+sugar)	Protein	Fat	Fiber	Calories kcal/lb	Feeding rate/ 1000 lb
Triple Crown Senior Gold	11.40%	15%	13%	18%	1,800	6+ lb
Triple Crown Senior Active+	12.90%	14%	12%	16%	1,535	5+ lb
Triple Crown Senior	14.70%	14%	10%	17%	1,546	6+ lb

Pelleted fat supplements like K Finish or Empower Boost are too high in NSC for hard keeper/thin ID horses. A pure fat supplement such as Cocosoya oil is better for underweight or hard keeper ID horses.