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Equine Metabolic Syndrome

What is it all about?

Equine Metabolic Syndrome (EMS) is an endocrine and metabolic disorder that commonly affects young to middle aged horses. There are several breeds who are genetically predisposed to developing this syndrome and are often referred to as "easy keepers", such as the Paso Fino, Quarter Horse, Morgan, Arabian, Tennessee Walking Horse, Saddlebred, and pony. It is important as horse owners to recognize and understand the clinical signs associated with EMS so that your horses can be properly diagnosed and managed to prevent further complications associated with this syndrome.

EMS is characterized by:

1. Insulin resistance (IR)
IR is the key feature of EMS and must be present for a diagnosis. The function of insulin within the body is to aid in metabolism by stimulating the cellular absorption of glucose which will maintain euglycemia (normal glucose levels). IR is defined as the failure of tissues to respond normally to insulin; essentially the tissues have a decreased sensitivity to insulin and require a higher concentration. Therefore, in order to maintain euglycemia, the body has to increase the concentration of insulin, which is referred to as hyperinsulinemia.

2. Obesity and/or regional adiposity
Overall obesity is most common with EMS; however, horses can develop regional adiposity alone or in conjunction with general obesity. Regional adiposity is described as large deposits of adipose tissue (fat) randomly dispersed under the skin and/or in particular areas such as the neck, tailhead, and the mammary gland or sheath.

3. Subclinical or clinical laminitis
Subclinical laminitis is identified by divergent growth rings of the hoof capsule, also known as founder lines, or rotation and/or sinking of the coffin bone that is seen on radiographs without any obviously associated clinical signs. Clinical laminitis will encompass the above as well as exhibiting clinical signs. Common clinical signs of

laminitis are hoof wall heat and pain exhibited by increased digital pulses, shifting their weight off the affected foot/feet, and sensitivity to hoof testers on the affected foot/feet.

EMS cannot be determined with diagnostic tests alone; the blood tests are utilized in conjunction with a clinical evaluation of each horse suspected of EMS. The most common diagnostic tests utilized are blood insulin, glucose, and leptin concentrations. The concentrations of glucose and insulin are evaluated together for the diagnosis of IR. If euglycemia and hyperinsulinemia are present, the horse is diagnosed with compensated IR and will need changes to their weight management and potentially pharmacological intervention to prevent laminitis. If hyperglycemia (increased blood glucose) and hyperinsulinemia are present, the horse has developed uncompensated IR as well as pancreatic insufficiency. These horses are at a high risk of laminitis and will need intense weight management in addition to being tested for Pituitary Pars Intermedia Dysfunction (Equine Cushing's Disease). Leptin is a hormone produced in adipose tissue that signals the area of the brain (the hypothalamus) that suppresses appetite after eating. Blood leptin concentrations are commonly increased in horses with EMS.

Once the diagnosis of EMS is made, there are several suggestions of how to best manage your horse. Weight loss can be achieved by reducing the overall caloric intake, reducing the sugar and starch content of your horses feed, increasing exercise, and limiting or eliminating access to pasture until IR improves. Feeding hay with a lower sugar and starch content can be achieved one of two ways, the hay can be submitted for analysis or the hay can be soaked in cold water for 60 minutes before feeding in order to lower the sugar content. Laminitis is an important factor to consider when managing horses with EMS. Horses with recurrent laminitic episodes or horses actively suffering from laminitis should never be allowed to graze pasture due to the sugar content. Additionally, annual radiographs of a metabolic horse's feet to monitor the position of the coffin bone within the hoof capsule is an excellent prophylactic measure.

Medical treatment can be pursued when management strategies are not enough to control the metabolic horse or if the management process needs to be accelerated for horses suffering from recurrent bouts of laminitis. There are two options currently available to treat the metabolic horse: levothyroxine sodium and metformin. Levothyroxine sodium can accelerate weight loss and improve insulin sensitivity in obese horses but should be avoided in the occasional lean horse who suffers from EMS. It is important to restrict feed access to horses receiving this drug because it can stimulate appetite, which may result in failure to lose weight if given free access to pasture. Metformin enhances the action of insulin within the tissues and initially does not result in hypoglycemia; however, long term effects are variable and need to be further investigated. Additionally, there is some anecdotal evidence that supports the following treatments: magnesium supplementation, chromium, clenbuterol, and cinnamon; however, these therapies need further studies to evaluate their efficacy.

If you suspect your horse may suffer from EMS, call your veterinarian for a full evaluation and bloodwork. It is imperative to begin managing the metabolic horse as soon as possible to prevent life-long problems with laminitis.