

Equine Metabolic Syndrome

Equine Metabolic Syndrome (EMS) is a disorder associated with an inability to regulate blood insulin levels (insulin dysregulation). Affected horses commonly show increased regional fat deposition and a reduced ability to lose weight. When affected horses consume meals high in specific carbohydrates (e.g. green grass or high grain feeds), their bodies produce higher than normal levels of insulin and are slow to return to baseline values. It is not known exactly how high insulin levels increase a horse's risk of developing laminitis; however, it is believed that the laminae are highly sensitive to the large amounts of circulating insulin, resulting in the development of laminitis (inflammation of the hoof laminae aka foundering). Some horse breeds are genetically predisposed to developing EMS including Warmbloods, Standardbreds, quarter Horses and most pony breeds.



Clinical signs of EMS may include:

- Regional adiposity—excessive fat in areas such as crest, prepuce, tail base, udder, and above the eyes.
- Generalised adiposity (obesity)
- Recurrent laminitis, especially when grazing pasture

Diagnosis of EMS is based on history, clinical signs and a thorough physical examination by your vet. There are a number of diagnostic tests available for EMS ranging from tests screening for insulin resistance to dynamic testing which involves fasting your horse overnight, taking baseline insulin and glucose levels then repeating testing after a meal.



Management of equine metabolic syndrome requires strict dietary modification with the addition of exercise to reduce obesity and improve insulin sensitivity. The prognosis for horses with EMS varies from horse to horse. Many horses respond well to management through diet and exercise. Horses that are “easy-keepers” or have persistently high insulin levels can be more challenging to manage and may require medical treatments.

CASE STUDY: Bob

Bob is an 11-year-old Welsh Pony that is used for showing and pony club riding. Dr. Ness was called out to examine Bob as he was still experiencing laminitic episodes and bouts of lameness following work, despite the owners' best efforts to manage and restrict his diet. Even with anti-inflammatories (Bute) on board. Bob was still uncomfortable and not sound enough to ride. On clinical examination, Bob was deemed to be in good body condition (5/9), however he did have regional adiposity (fatty deposits) over his rump and crest region. Radiographs of Bob's front feet were taken to assess the health of the pedal bone (looking for evidence of pedal bone rotation, sinking and sole depth) and to assist with future farriery appointments. The hoof radiographs illustrated distal displacement of P3 in both feet, however the right fore appeared to have more significant rotation and distal displacement of P3. The length of the yellow lines between the dorsal aspect of pedal bone and hoof wall will increase in size (cm) as laminitis progresses as seen on the radiographs. We have adequate sole depth on both left and right fore feet.

Blood was also taken at the time of the appointment to determine both his insulin and cortisol levels. Bob was diagnosed with Equine Metabolic Syndrome following recurrent episodes of pasture associated laminitis and an elevated resting hyperinsulinemia. EMS is characterised by insulin dysregulation and abnormal adipose tissue distribution. This syndrome results from an interaction between genetics and environment and thus the risk of laminitis in the individual animal therefore depends on the relative weighting of these influences.

