



## The Interconnectivity of Laminitis, Insulin and Metabolic Disorders.

Laminitis is a debilitating condition that, when severe, can be fatal. Laminitis occurs when the laminae (the tissue that attaches the coffin bone to the hoof wall) becomes inflamed and the bone begins to pull away from the hoof or even penetrate the sole of the hoof. Depending upon the severity, outcomes can range from mild soreness to extreme pain.

Laminitis is beginning to be viewed not as an isolated disease, but instead as a syndrome that is the result of other systemic issues. This means that we need to identify and treat the underlying cause of the laminitis in addition to directly addressing the associated lameness and pain.

The two most common types of laminitis are:

- Sepsis Associated Laminitis (SAL) – a systemic inflammatory response – that can be caused by colitis, retained placenta or acidosis from grain overload. Studies indicate that only about 10-12% of laminitis cases are related to SAL.
- Endocrinopathic Laminitis (EL) caused by issues related to disorders such as Equine Metabolic Syndrome (EMS) or Pituitary Pars Intermedia Dysfunction (PPID) that is sometimes referred to as Cushing's disease. EL also includes Pasture Associated Laminitis (PAL). Studies indicate that approximately 90% of laminitis cases fall into this category.

### HYPERINSULEMIA AND LAMINITIS

As mentioned, EMS and PPID are common underlying causes for Endocrinopathic Laminitis. EMS is not a disease, but rather a description of risk factors for the most common type of laminitis (EL). Insulin dysregulation is a key component of EMS and often results in hyperinsulemia (abnormally high insulin levels). EMS is typically seen in middle-aged horses, and these horses are more likely to be obese, suffer from hypertension and exhibit increased fasting triglyceride (a type of fat found in the blood) levels.

How might EMS lead to laminitis? Models indicate that hyperinsulemia is associated with laminitis, and this has led to the development of a couple of different theories. One describes how high levels of insulin in the blood create a cascade of events that lead to the constriction of blood vessels in the tissues in the hoof. This would limit both nutrient and oxygen flow to the tissues, which could result in laminitis. The other is that abnormally high insulin levels trigger excess production of specific growth factors that weaken certain tissues in the hoof, again leading to the onset of laminitis.

PPID is an endocrine or hormone disorder and is usually seen in older horses. Studies have shown that horses with PPID are more likely suffer from hyperinsulemia and laminitis. Again, the connection between abnormal insulin levels and laminitis appears.

## TREATMENT AND MANAGEMENT OPTIONS

There are several approaches to reduce the incidence or severity of laminitis. First, consult your veterinarian. Your vet will be able to diagnose whether your horse has EMS or PPID. Following a positive diagnosis, a team made up of a veterinarian, nutritionist and feed company representative can be utilized to develop a proper management and nutrition plan for PPID and EMS.

Any “at-risk metabolic horse” with a history of laminitis or documented insulin dysregulation should be fed diets low in soluble nonstructural carbohydrates (NSC) – sugars and starches. Both lush, fast-growing and froststressed pastures are higher in NSC and should be avoided. An at-risk horse could be “pushed over the edge” by consuming grasses from these types of pasture and begin to exhibit pasture associated laminitis (PAL).

Grazing muzzles can help control intake, and suggested grazing times should be focused on early morning when sugars are lowest in the plants. Some laminitis cases cannot tolerate any pasture and must be turned out on dry lots for exercise. The NSC content of hays should also be monitored, and if needed, hay can be soaked in water to reduce soluble carbohydrates.

## HOW CAN CHROMIUM HELP?

Preliminary equine research suggests that supplemental chromium could also help support horses with insulin resistance or dysregulation, but further case-controlled studies are needed. Daily chromium supplementation, in combination with the management plans discussed, can be part of a comprehensive support solution. Chromium propionate has been proven to improve insulin sensitivity and may lead to better outcomes in these horses.

Learn more at  
[www.kemin.com/chromiumeq](http://www.kemin.com/chromiumeq)



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