

PASTURE ASSOCIATED LAMINITIS

BY: RAUL BRAS, DVM, CF
ROOD AND RIDDLE EQUINE HOSPITAL

It's spring! We finally get to enjoy driving around the beautiful Kentucky farms watching the horses graze on the luscious bluegrass. Unfortunately, this is the time when predisposed horses/ponies are at a high risk to "grass founder". Pasture associated laminitis typically develops after the grass grows rapidly in the spring. There are many different conditions and/or situations that can cause laminitis. Specific breeds and bloodlines such as Saddlebreds, Tennessee Walking Horses, Morgans, Paso Finos, Arabians, Warmbloods, and pony breeds are genetically predispose, however all breeds are at risk. A Horse/pony at risk is generally overweight, known as "easy keepers", and usually of middle age. When a horse/pony founders the lamina detaches between the distal phalanx and the inner hoof wall causing unrelenting pain and characteristic lameness. Is the most serious disease of the equine hoof that lead to devastating loss of function. In order to understand how to rehabilitate the laminitic horse/pony we should have an understanding of the normal supporting structures of the digit, the disease process, and the structural failure that results.

Obese horses/ponies have been associated with Equine Metabolic Syndrome (EMS). EMS is defined by the presence of obesity and regional adiposity, insulin resistance (IR), and laminitis. Regional adiposity takes the form of expanded adipose tissue deposits within the neck (cresty neck), prepuce, and tailhead. Endocrinopathic laminitis is a general term that describes laminitis that develops in horses/ponies with endocrine/metabolic disorders. This includes laminitis that is associated with obesity, IR, pituitary pars intermedia dysfunction (PPID), and lush pasture. Pasture grazing contributes to obesity in metabolically efficient horses/ponies because large amounts of energy are consumed when grass is abundant. Sugars from pasture grass also exacerbate IR and contribute to the progression of this condition. Pasture grazing contributes to the development of obesity and IR and represents a dynamic factor that may trigger laminitis. Obese horses/ponies are more likely to develop laminitis if they are insulin resistant, but

obesity itself may also contribute to laminitis susceptibility. Researchers have studied the predisposing factors for pasture associated laminitis and shown that IR ponies are more likely to develop the disease. However, the actual triggering factors must still be determined.



Raul Bras, DVM, CF

Lush pastures are a laminitis risk because they are high in soluble carbohydrates—simple sugars and starches that are readily broken down by the bacteria in the horse's /pony's large intestine. A lush pasture challenges the gastrointestinal tract because grass is consumed in large quantities over a relatively short period of time. Fructan is one of the most important soluble carbohydrates found in grass. Levels in the pasture are highest in the spring and summer months. The riskiest time for a laminitis-prone horse/pony to be on pasture is between late morning and late afternoon, in the spring or early summer. On sunny days, fructan levels gradually rise during the morning, peaking around noon, gradually decline and are lowest just before dawn. The carbohydrate content and composition of the grass varies markedly over this time. Alterations in the gastrointestinal microbial flora have been one of the theories that trigger laminitis. Pasture associated laminitis can be explained by this theory by recognizing that pasture horses/ponies are subjected to carbohydrate overload as grass grows rapidly and sugars accumulate.

Preventing pasture associated laminitis is as simple as limiting the horse's/pony's access to lush pasture, but preventing laminitis in horses/ponies with endocrine related laminitis, and in those that have had grass founder before can be more challenging. Currently, dietary management (lower carbohydrates) and increased exercise resulting in appropriated weight loss and improved insulin sensitivity provide the best chances of preventing laminitis in EMS. Exercise should be increased in obese horses/ponies with the primary intention of

improving insulin sensitivity and secondarily decreasing excess body weight. All soluble carbohydrates in the form of grain feeding and treats should be removed from the diet of horses/ponies diagnosed with EMS. In many cases, hay will become the entire diet of the horses/ponies with EMS. Hay should have a nonstructural carbohydrate (NSC) content of less than 12%. The hay should be fed at approximately 1.5% body weight (BW). When unsure of the NSC content of hay soaking the hay in cold water for 30 minutes may remove some of the sugars in the hay. Pelleted hay with low NSC content and timothy cubes are commercially available and promoted as an alternative feed for horses/ponies with EMS or equine cushing's disease (ECD). During times of dynamic grass growth, especially spring, a grazing muzzle would be required to prevent overconsumption of high NSC grasses. Limiting pasture intake include restricting the horse's/pony's pasture time to only a few hours per day avoiding those high-risk hours between late morning and late afternoon. Early recognition of laminitis is important to prevent structural damage to the hoof's integrity since pain related to laminitis may prevent adequate exercise.

In order to fully understand how to treat a laminitic horse we must first understand some of the mechanics/forces at play. The laminae and DDFT work in harmony to balance forces with each other in a healthy foot. During laminitis these forces in the foot are thrown out of balance allowing the stronger force, most of the time the DDFT, to pull the bone away from the wall making it unstable. Some of the immediate goals to rehabili-

tate the laminitic foot are decreasing the pull of the DDFT on the coffin bone, unloading the laminar interface, reducing inflammation, easing breakover, protecting sensitive tissue, and providing support to the bony column.

There is no proven medical treatment for equine metabolic syndrome, although some drugs are used by some veterinarians. Trilostane (0.5mg/kg orally) has been used with improvement in horses/ponies with EMS. Horses/ponies that maintain high body condition scores in spite of dietary management and exercise can be treated with thyroxine (0.1mg/kg orally). Supplement of chromium (1mg/100lbs) and magnesium (30mg/kg) has been recommended in hopes of improving insulin sensitivity. If the horse/pony has no access to pasture, vitamin E, beta carotene, and a balance mineral mix has also been recommended. Monitoring response to treatment and management changes in EMS should also include baseline serum insulin levels testing at least twice a year. Pergolide is an effective treatment for ECD and should be recommended for all horses/ponies diagnosed with this disease. Metformin (15mg/kg orally twice a day), a drug commonly prescribed for treatment of human IR appeared to increase IS in horses, but researchers suggest that a low bioavailability and a rapid rate of elimination of the drug might explain the varied reports of clinical success for improving insulin sensitivity in horses. In addition to the medical, nutritional, and exercise management needs for EMS and ECD, proper and routine hoof care is particularly important, and should be provided.



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