

An Owner's Guide to Equine Metabolic Syndrome

What is Equine Metabolic Syndrome?

Overweight horses, ponies, and donkeys are often affected by Equine Metabolic Syndrome (EMS). EMS is an endocrine condition that affects the body in three ways: obesity and/or localized fat deposits, insulin dysregulation, and laminitis.

How does EMS affect animals?

The key hormonal problems in EMS are related to the release and function of insulin; this is called "insulin dysregulation." Insulin is normally released by the pancreas after a meal and signals body tissues to take up glucose (sugar). The fat deposits in animals with EMS release hormones that affect the tissue's ability to respond to insulin. The pancreas then typically releases even more insulin to overcome this lack of sensitivity to the hormone - this is called "insulin resistance." As a result, insulin concentration in the blood is higher in animals with EMS after a meal and, sometimes, throughout the entire day. This is similar to the metabolic abnormalities that accompany type 2 diabetes in humans.

Laminitis, a major part of EMS, is a crippling disease caused by weakening of the tissues (laminae) anchoring the hoof wall to the bone. These tissues are damaged by inflammation and the abnormal metabolic and hormonal states caused by EMS. The bone may rotate within the hoof capsule, leading to chronic lameness, sometimes severe enough to warrant euthanasia. Horses with EMS can experience mild episodes that are not easily recognized, especially if the horses are not exercised regularly. Repeated mild laminitis episodes cause cumulative damage over time, leading to more severe lameness. Many horses already have evidence of chronic laminitis at the time that EMS is first recognized, making early detection of EMS vital. In addition to laminitis, overweight horses may develop more severe metabolic problems when affected by other diseases (such as colic, diarrhea, or pneumonia), complicating their treatment.

What causes EMS?

EMS is a result of genetic predisposition combined with environmental and physiological factors such as obesity, high sugar diets, lack of exercise, and concurrent illnesses. Horses and ponies with EMS are often described as being "easy keepers" and have a tendency to become overweight. Noticeable fat pads may develop over the neck crest, tail head, shoulders, and around the mammary glands or prepuce.

Metabolism is partially determined by genetics. While horses of any breed may develop EMS, certain breeds are predisposed. Donkeys, ponies, Arabians, Morgans, Saddlebreds, Paso Finos, Spanish Mustangs,

and Warmbloods are among those at highest risk, while EMS is uncommon in Thoroughbreds and Standardbreds. It is equally common in males and females, and most affected animals are diagnosed between 5 to 15 years of age.

Should my animal be tested for EMS?

Because overweight animals are at risk of developing laminitis, they should be assessed for EMS. Animals with normal weight but that have noticeable fat accumulation (as mentioned above) should also be evaluated. EMS should also be considered in any horse with unexplained forelimb lameness, since laminitis is sometimes the first sign of EMS. Numerical body condition scores are used to rate a horse's degree of obesity, and are useful in monitoring the success of weight loss programs.

How is EMS diagnosed?

Screening for EMS is commonly done by measuring blood insulin and glucose concentrations, and this is useful for identifying animals with moderate to severe insulin dysregulation. However, in less affected animals, metabolic abnormalities may not yet be severe enough to detect with this screening method and dynamic tests are needed to uncover insulin resistance.

Dynamic tests evaluate the body's responses to an oral or intravenous glucose challenge, specifically looking for an exaggerated insulin response. Early detection of EMS allows implementation of management changes to promote weight loss and improve the body's responsiveness to insulin before enough laminar tissue damage occurs to cause lameness.

How is EMS treated?

Because most horses with EMS are overweight, the mainstay of treatment involves management changes that promote weight loss. These include reducing overall calorie intake, dietary sugar restriction, and increased exercise. Typically, grain and pasture grazing are eliminated during the initial weight loss phase. Once horses lose weight, most can resume pasture turnout as long as they wear a grazing muzzle. Under certain circumstances, medications may be used to help promote weight loss and improve insulin sensitivity. Your veterinarian will work with you to design a customized management plan tailored to your horse's individual needs.

If your horse has already developed laminitis, proper therapeutic farrier care and careful use of analgesic medications are essential. Your veterinarian and farrier should work together to determine the best techniques to help improve your horse's comfort level and quality of life.

This fact sheet is provided by the Veterinary Diagnostic Laboratory at the Michigan State University College of Veterinary Medicine as a public service. It is not intended to diagnose any disease. Please contact your veterinary medical service provider if you have questions regarding this or any other veterinary medical issue.

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