Managing Equine Metabolic Syndrome

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Introduction

Equine metabolic syndrome (EMS) is a relatively new disease that we are still learning about. There are many things to investigate when dealing with a new disease: causes, predispositions, symptoms, secondary issues, treatments, and prevention. Because changing the animal's feed regimen is currently the most effective and well-known way to manage EMS, this fact sheet will focus primarily on how diet can impact affected horses. As a newer syndrome, it is vital to learn as much as possible about it to understand, treat, and prevent this disease.

Equine Metabolic Syndrome Clinical Signs and Diagnosis

EMS is associated with insulin dysregulation, increased fat deposition, and difficulty losing weight. Essentially, when the affected equine consumes high levels of carbohydrates, its body produces excess insulin and takes a long time to return to baseline. There is a lot of overlap between factors leading to EMS and factors leading to obesity: quality and quantity of feed provided, exercise, and history of laminitis, and there have been some ties to familial patterns suggesting heredity for EMS (Frank et al., 2010). The main clinical sign of EMS is insulin dysregulation. This often, but not always, leads to an obese horse with regional fat deposits. The excess fat is typically concentrated in the neck, giving a very "cresty" appearance (Young, 2020).

Veterinarian diagnosis of EMS can include a physical examination and blood tests to determine insulin resistance. Current tests for insulin resistance measure glucose and insulin concentrations in single blood samples (Frank et al., 2010). There are a few other tests that can find insulin or glucose tolerance or sensitivity. Radiographs of the feet may also be necessary to determine the severity of secondary laminitis problems.

Secondary Issues

Laminitis

One of the main secondary issues from EMS is laminitis, the acute inflammation of the laminae (the tissue connecting the hoof wall to the coffin bone). Laminitis can be secondary to EMS because the consumption of excess carbohydrates and insulin resistance can trigger laminae inflammation. Chronic changes to the horse's foot, referred to as founder, can permanently alter the growth of a horse's foot. There are varying causes for

laminitis; the one closely connected to EMS is carbohydrate overload, typically through an overload of high-starch grain (Pollitt, 2004).

Reproductive Concerns

Another implication of EMS can be reproductive issues, including loss of the anovulatory period and a prolonged interovulatory period in mares (Frank, 2010). Stallions with EMS and resulting obesity would not be good breeders, being unmotivated and possibly unable to mount.

Joint Stress

Additionally, another issue that can arise from EMS, and more specifically from the obesity part of the syndrome, is excessive joint stress and eventual breakdown. When the horse is extremely overweight, it is very hard on their joints and limbs to support all their weight, resulting in extra concussion on the joints when moving.

Treatment Through Diet

Restricting Feed

The most common treatment for EMS is restricting feed. Horses with EMS should only be fed 1.5% of their ideal body mass of good quality hay daily. Additionally, limiting the intake of nonstructural carbohydrates (also known as NSCs) is important. Nonstructural carbohydrates are prevalent in pasture grasses and some hays. The nonstructural carbohydrate content of forage can be found through feed analyses and ideally should make up < 10% of the feed for horses with EMS (Young, 2020). Lowering the nonstructural carbohydrate content is intended to decrease the high glucose and high insulin response to the food the horse eats (Frank et al., 2010).

Soaking Hay

Another suggestion is soaking hay before feeding. A portion of the nonstructural carbohydrate leaches out of hay through the soaking process (Argo et al., 2015). One step further is adding supplements to a horse's diet. Supplements aren't under any regulations or restrictions, so you must be careful with them. Also, we lack significant research or scientific claims to support using supplements, so while they may help on a case-by-case basis, there is no guarantee they will work for every horse. Restricting feed intake and soaking forage is currently the most reliable management technique.

Other Management Considerations

Aside from feed management, there are some other strategies to reduce EMS symptoms. The most common ways include increased exercise, other weight management strategies, and some insulin sensitizers can help with insulin dysregulation.

Exercise

Increased exercise in combination with diet options will help reduce weight, which in turn helps manage secondary issues, like laminitis and joint

stress. Exercise also can result in a sustained increase in insulin sensitivity (Frank et al., 2010). When introducing exercise to manage EMS, you must consider where the horse is physically and not push too hard and too fast, which can make the situation worse. It could be a good strategy to begin with diet restriction to get weight loss started, and then start with low-impact exercise, increasing to more strenuous levels as appropriate.

Medicine

Additionally, there are some medicines for treating EMS. Two widely recognized options are levothyroxine sodium and metformin. Both have shown improvements in hyperinsulinemic horses when given consistently (Frank et al., 2010). Make sure to consult a veterinarian before adding either medication to a horse's diet.

Conclusion

You can manage horses with EMS with some work and improve the symptoms and secondary issues. Veterinarians are vital in diagnosing and treating EMS. Restricting and soaking forages decreases nonstructural carbohydrates in the feed, which greatly helps with the insulin dysregulation that is so closely tied to this syndrome. Some supplement options have potential, but more research is needed to prove their efficacy. Aside from adjusting the animal's feed, exercise can be a helpful tool for weight management and insulin sensitization.

References

Argo, C. McG., Dugdale, A. H. A., & McGowan, C. M. (2015). Considerations for the use of restricted, soaked grass hay diets to promote weight loss in the management of equine metabolic syndrome and obesity. *The Veterinary Journal, 206*(2), 170–177. https://doi.org/10.1016/j.tvjl.2015.07.027

Frank, N., Geor, R. J., Bailey, S. R., Durham, A. E., & Johnson, P. J. (2010). Equine metabolic syndrome. *Journal of Veterinary Internal Medicine, 24*(3), 467–475. https://doi.org/10.1111/j.1939-1676.2010.0503.x

McGowan, C. M., Dugdale, A. H., Pinchbeck, G. L., & Argo, C. McG. (2013). Dietary restriction in combination with a nutraceutical supplement for the management of equine metabolic syndrome in horses. *The Veterinary Journal, 196*(2), 153–159. https://doi.org/10.1016/j.tvjl.2012.10.007

Morgan, R. A., Keen, J. A. & McGowan, C. M. (2016). Treatment of equine metabolic syndrome: A clinical case series. *Equine Vet Journal, 48,* 422-426. https://doi.org/10.1111/evj.12445

Morgan, R., Keen, J., & McGowan, C. (2015). Equine metabolic syndrome. *Veterinary Record, 177,* 173–179. https://doi.org/10.1136/vr.103226

Pollitt, C. C. (2004). Equine laminitis. *Clinical Techniques in Equine Practice, 3*(1), 34–44. https://doi.org/10.1053/j.ctep.2004.07.003

von Münchow, A., Torp Yttergren, S., Jakobsen, R. R., Luthersson, N., Hansen, A. K., & Lindenberg, F. (2023). Oligosaccharide feed supplementation reduces plasma insulin in geldings with equine metabolic syndrome. *Frontiers in Microbiomes, 2.* https://doi.org/10.3389/frmbi.2023.1194705

Young, A. (2023, April 11). *Equine metabolic syndrome.* University of California, Davis School of Veterinary Medicine. https://ceh.vetmed.ucdavis.edu/health-topics/equine-metabolic-syndrome

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