Cinder Hill Equine Clinic

Equine Metabolic Syndrome (EMS)

Equine Metabolic Syndrome (EMS) is veterinary term to describe horses and ponies who suffer from obesity, insulin resistance and are at an increased risk of laminitis.

Some breeds of horse and pony are at risk of developing EMS because they have evolved to survive in harsh environments. The native pony breeds are a classic example of this, but others include those adapted to hot, dry environments such as Andalusians and Arabs. These breeds have extremely efficient metabolisms which means they can thrive on limited calories. Although this is essential for survival in the wild, it can have long term implications in domestic settings where these animals are kept warm and dry and have free access to plentiful calories. Over time these animals can gain more and more weight, and crucially, don't lose the weight over the winter as they would in the wild.

Year on year a horse or pony can gradually get fatter and fatter which profoundly affects their metabolism. They start to lay down fat pads filled with abnormal fat cells which release various hormones and factors into the blood stream. These hormones will have profound effects on a horse's metabolism which ultimately causes a condition called insulin resistance (very similar to Type II Diabetes in humans).

Although most common in native breeds, EMS can occur in any breed if they become extremely obese. Equally, EMS isn't a foregone conclusion in domestic native breeds. Weight control and regular exercise can keep EMS at bay. If a horse or pony does develop EMS, it is reversible, although for this to occur extreme exercise and dieting is usually required. The underlying genetic potential will remain so management must be rigorously maintained long term.

Why is the diagnosis of EMS important?

The main consequence of EMS is that it puts the horse or pony at an increased risk of laminitis. It is now known that laminitis is not caused by grass alone, but due to insulin resistance affecting how a horse's body responds to that grass. When horses and ponies with insulin resistance consume rich grass or feeds high in sugars and starch, abnormally high levels of insulin are released into the bloodstream. For reasons we do not currently fully understand, high levels of insulin cause inflammation and damage to the delicate laminae in the foot. It is thought that damage to the blood vessels that supply the foot and increased activity of potentially damaging enzymes play a role. Laminitis can be an extremely painful condition and in severe cases can be life threatening. By diagnosing and managing EMS we can reduce a horse or pony's risk of developing this condition.

Diagnosing EMS

Obesity is the classic indicator of EMS. This obesity can be 'generalised' (i.e. the horse or pony is fat all over) or 'localised' where the horse might not be particularly fat over its ribs but has fat deposits in certain parts of the body. Classic places for these fat deposits are over the crest, around the top of the tail and behind the shoulder blades. Horses and Ponies with EMS will often be much more resistant to weight loss than a normal horse, tend be very good doers and seem to "live off fresh air". Occasionally we do see cases of EMS that are not obese.

Blood testing is not always required to diagnose EMS, particularly if the horse has a classic pattern of obesity and is suffering from laminitis. But in some cases, blood testing can be useful to confirm the diagnosis. It can also help to assess the degree of laminitis risk for an individual and monitor their response to treatment.

EMS is best tested for using an oral sugar test. After a period of starvation (usually overnight) a measured volume of sugar in the form of corn syrup is fed. A blood sample is taken from the horse 60-90 minutes later to measure the horse's insulin levels in response to the sugar. Horses and ponies with EMS will have very high levels of insulin following this test as they produce an exaggerated insulin response to feeding. Horses and Ponies with more severe EMS will have an increased resting insulin, i.e. an increased insulin without having to perform the oral sugar test.

Treatment and management of EMS

By far the most important treatment for Equine Metabolic Syndrome is diet and exercise. Sugar and starch levels should be reduced as much as possible by avoiding or severely restricting grazing, avoiding concentrate feeds and feeding forage low in non-structural carbohydrates (NSC's). This can be achieved by feeding chaff products designed for laminitis prone individuals and soaking hay for at least 6-8 hours in fresh water before feeding. Soaking hay has been shown to significantly reduce the NSC content of hay. When initially treating EMS and trying to achieve significant weight loss you should aim to feed 1.5% of your horse's body weight per day. It is important that the diet remains balanced and contains adequate levels of protein, vitamins and minerals. The best way to achieve this is to feed a comprehensive feed balancer. There are several commercially available that are specifically designed for laminitis-prone individuals.

Exercise is also extremely vital in the long-term management of EMS. Exercise has been shown to significantly improve the uptake of glucose by muscles, reduce blood sugar levels, and increase insulin sensitivity. To be truly effective at controlling EMS this exercise does need to be regular and quite intense (once fitness levels have been carefully built up). Hill work or canter work should be included in the exercise plan at least 3 times a week. For ponies that are too small to be ridden

activities can include lunging, long reining, driving and loose schooling.

If laminitis is present, exercise will not be possible until inflammation in the feet has completely settled, and the horse or pony is sound. Therefore, in these situations, medical therapy is often used alongside diet to try to mimic the effects of exercise.

Our current treatment of choice for EMS cases is Ertugliflozin or Canagliflozin. These are both drugs used in humans for type 2 diabetes and prevents absorption of glucose in the kidneys and causes glucose loss in the urine and can be effective in reducing insulin levels.

Metformin is a human drug, known as an oral hypoglycaemic. Its effects in horses are not fully understood but it is thought that it helps to block absorption of glucose from the intestine, and also assists muscle cells to take up glucose. The drug is safe to use in horses, and is relatively cheap, but absorption after feeding can be limited and it is not often used nowadays.

It is also possible to speed up weight loss using a thyroid hormone called levothyroxine. Although effective, the drug is very expensive and so is not routinely used.