

# FACT SHEET

## Metabolic Syndrome

The time of year is here again when every pony owner starts to worry about grass induced laminitis, and as usual we are all amazed at how little grass seems to be needed for ponies to become obese. Equally puzzling is why some ponies are so prone to laminitis that they will develop a bout of illness after a few hours on lush green pasture, while others seem to be almost immune. Fortunately, as veterinary medicine advances we now know are now in a better position to understand the causes behind grass induced laminitis and are therefore able to do more to prevent it occurring and identify the individuals which may be at risk.

### What is laminitis?

Laminitis is inflammation of the sensitive tissues (laminae) which hold the pedal bone (the bottom bone in the hoof) to the hoof capsule. In general, when tissues become inflamed, they swell, however as the laminae are contained within the hoof capsule they are unable to do so and the pressure generated is extremely painful. As the inflammation progresses, the structure of the laminae deteriorates so that the pedal bone is no longer held in place and begins to drop or rotate. In severe cases, the pedal bone can protrude through the bottom of the hoof.

### What Is Equine Metabolic Syndrome?

Picture the following scenario: a fit, lean, young thoroughbred and a fat, middle-aged, native pony are turned out in July on the same, lush pasture. Which one is likely to develop laminitis? Chances are you said the pony! In fact, some horses seem to be able to graze lush pasture all spring and summer long without showing any ill effects, while others will develop an attack of laminitis within days or even hours. The equines that are most prone seem to be fat, overweight native ponies, especially those considered 'good doers' while athletic, larger breeds appear to be almost immune.

The explanation to this must be that some individual horse's and pony's bodies (or more specifically their metabolisms) respond differently to the feed they consume. So what is happening differently in the metabolism of a fat laminitic pony to that of a thoroughbred racehorse when it eats lush grass?

In humans obesity can lead to the body becoming resistant to a hormone called insulin, which is important in utilising glucose in the blood. When this situation arises in people, they are at high risk of developing type II diabetes and heart disease and are considered to have 'metabolic syndrome'. It has recently been shown that insulin resistance also occurs in overweight horses and this gives us a clue as to what may be happening differently inside the fat, native pony compared to the thoroughbred in the above scenario.

When insulin resistant horses or ponies consume feeds that are high in sugars (such as lush green grass), their blood glucose levels increase, leading to very high levels of insulin in the bloodstream.

Humans in this situation would be at risk of diabetes and heart disease, however studies have shown that these high insulin levels in horses directly lead to laminitis (less commonly in horses can also develop type II diabetes mellitus, infertility and lethargy). So we now say that obese horses that have insulin resistance and are at risk of developing laminitis have equine metabolic syndrome or EMS.

Native ponies have evolved to live in relatively harsh environments where food is often in short supply. In a sense it is not their fault they get fat, their bodies (and appetites!) are designed to make use of whatever nutrition is available. Unfortunately for them, we maintain them in conditions where a plentiful supply of nutrition is available all year round, most especially in spring and summer, when their weight and resistance to insulin can spiral out of control.

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### How is Equine Metabolic Syndrome Diagnosed?

Unfortunately we can't tell by looking whether a horse or pony has equine metabolic syndrome or not, although often we can be very suspicious. Many horses with EMS are clearly obese, however often they show what is known as regional adiposity. This means that fatty deposits are laid down unevenly, so while some horses have easily visible ribs (and may even be described by their owners as lean), closer examination reveals large, cresty necks and fatty deposits behind the shoulders and tail head. To make things even trickier, some horses will have hidden 'retroperitoneal' fat deposits within their abdomens that can only be seen on an ultrasound scan, these horses may not appear overweight at all on the outside.

As such we should be suspicious of equine metabolic syndrome in horses not only if they are overweight, but also if they have ever had on attack of grass induced laminitis.

Definitive diagnosis of metabolic syndrome requires a blood sample. Measuring insulin levels following an overnight fast (hay and food removed after 10pm) is sufficient to diagnose the condition in approximately one quarter of affected horses, while a more accurate test involves a blood sample to be taken two hours following a meal containing a set amount of glucose.

### Management and Treatment

Weight loss is an important goal of management in most cases of EMS, so dietary restriction is usually necessary. Total control of the diet is needed and limiting time at pasture is not acceptable as in many cases as ponies can consume huge amounts of grass in short periods of time. Muzzles can be helpful but in most cases it is safer to stable or turnout in strictly grass free paddocks and feed only measured quantities of hay, supplemented with a commercial ration-balancer. Cereals, grass, carrots and apples should be avoided as can cause blood insulin levels to spike.

Exercise is definitely helpful, as it can reduce obesity and also independently reduces insulin levels. An exercise regime is often essential in the management of EMS, but must not be instigated until symptoms of laminitis are under control.

Metformin is a prescription drug used in the management of human diabetes mellitus. Some studies have shown that it can help to reduce insulin levels in horses with EMS. It is not a substitute for management measures but may be used as an adjunct to treatment in some cases.

*NOTE: It is dangerous to starve horses and dietary restriction should always be carried out under the guidance of a vet or trained nutritionist.*

If you are concerned your horse may be have signs of equine metabolic syndrome or laminitis, please contact the practice on 01505 610100.