

# EMS (Equine Metabolic Syndrome)



The term EMS is used to describe horses and ponies with an insulin-resistant phenotype linked with laminitis susceptibility. EMS can also refer to a state of hormonal and metabolic derangement which the body gets when storing excessive body fat ie. this fat essentially changes the horse's metabolism.

The term EMS initially referred to a syndrome of obese, 'cresty' horses with laminitis. These horses also had normal pituitary function but increased cortisol (a hormone essential to regulate conditions within the body) activity in peripheral tissues. Horses with EMS are typically good-doers, easily becoming overweight on what appears to be very minimal feed.

## Predisposing Factors

- Genetic predisposition, within and between breeds eg. Natives and "cobs" may be more prone
- Age is thought to reduce the horse's sensitivity to insulin
- Long term feeding of meals high in starch and sugar, which can cause significant spikes in blood glucose and insulin levels
- Young horses who are fed excessive quantities of grain may be more likely to become obese later in life, potentially increasing the risk of laminitis and EMS

## Insulin Resistance

Insulin resistance can be defined as an abnormal physiological response to the ingestion of feedstuffs that are eventually broken down into glucose or other sugar molecules. When feedstuffs containing glucose are fed, it causes a normal state of hyperglycaemia (elevated sugar levels in the blood). This prompts the release of insulin from the pancreas, encouraging the removal of glucose from the bloodstream by fat or skeletal muscle cells.

Once in the cells, glucose can be used immediately to fuel exercise or growth, or can be stored as glycogen or fat for later use. Insulin resistance implies that either the liver or the peripheral tissues (skeletal muscles or fat cells) are relatively insensitive to insulin activity, or that the quantity of insulin released in response to hyperglycaemia is diminished. As such, the glucose remains in the blood. As a result, the glucose levels remain high and the pancreas continues to discharge insulin, leading to elevated concentrations of insulin in the bloodstream, known as hyperinsulinemia.

## Symptoms of EMS

Horse and ponies suffering from EMS may display one or more of the following symptoms:

- Obesity - Both generalised and regional adiposity (fatty tissue) – typically enlarged crest and fat pads and often abnormal fat distribution
- Recurrent laminitis
- Tends to occur in young to middle aged horses



“...If diet AND exercise are not controlled simultaneously, the efficacy of weight loss is considerably lower



If you suspect that your horse has one or more of these symptoms, contact your vet for a diagnosis. This may initially be achieved from history alone but, in order to clinically diagnose EMS, a vet needs to conduct a test to establish the basal insulin concentrations and/or glucose and insulin dynamics, in response to oral or intravenous glucose administration. Affected horses may have excess levels

of insulin circulating relative to the level of glucose at rest, or show an exaggerated increase in serum insulin in response to glucose administration.

## Management

Strict management is required for weight loss and to improve insulin sensitivity. If diet AND exercise are not controlled simultaneously, the efficacy of weight loss is considerably lower.

- Daily low intensity exercise encourages weight loss and helps to improve insulin sensitivity, providing laminitis is not a limiting factor.
- Any changes in management, including diet, need to be made slowly over 2-3 weeks. Safe, significant weight loss can take upwards of 9-12 months.
- Weight and condition should be monitored every 1 to 2 weeks to recognise progression over time. The use of weightapes (around the girth and crest), and body condition and “cresty neck” scoring are ideal.
- Where possible, using the winter to your advantage for weight loss is ideal.
- Management practices such as using lighter weight rugs can encourage further weight loss.
- It is important that management and diet maintain trickle feeding and a continuous flow of fibre through the digestive system as there is evidence that this reduces peaks and troughs in the levels of insulin and leptin in the blood stream. Leptin is produced by fatty tissue and is thought to regulate fat storage so avoiding peak levels could reduce the risk of excess fat deposition.

## Medication

For horses that do not respond to strict dietary and exercise management, vets may recommend medication, like Metformin, to promote weight loss and improve insulin sensitivity. However, this should not be seen as a replacement to reducing calorie intake and increasing exercise. It is also thought that medication may be most useful when given prior to starch and/or sugar ingestion, for example pre-turnout.

## Encouraging Weight Loss/Waistline Control through Diet

### Forage

- To help control sugar intake, forage (hay/haylage) should ideally have a water soluble carbohydrate (wsc) content of below 10%, yet this can only be confirmed by having it scientifically analysed. As a rule, later cut, coarser hay/haylage is generally lower in wsc.
- Soaking hay for 12 to 16 hours will help to reduce the wsc content. Build up to this gradually as soaking can reduce palatability and be careful in warm weather to avoid fermentation or bacterial growth.
- Good quality oat or barley straw are very low in calories and very high in fibre so may be used to replace part of the hay/haylage ration to reduce overall calorie intake. However, we would not recommend replacing more than 30% of the forage ration with straw as otherwise the level of indigestible fibre in the diet will be too high. Also note that this option is suitable for horses with any dental compromise and, as with any feed, should be introduced very gradually.

- Forage intake should be restricted to the equivalent of 1.5% of the horse's bodyweight per day. Weigh all forage before soaking and use small-holed nets to make a small amount last longer and keep the horse chewing.
- Time at grass will need to be carefully managed to control fructan (sugar) intake. Turning out very late at night, when grass fructan levels are lowest, and ensuring the horse is brought in by mid-morning, is safest. Avoid turning out onto pastures during cold, bright conditions, (e.g. frosty mornings), when the fructan levels increase.
- In addition to the above guidelines regarding turnout, access to grass may need restricting by use of strip grazing, muzzling etc.
- Light Chaff or Speedi-Beet may be fed as low calorie alternative or additional fibre sources as long as overall fibre/calorie intake is controlled.

### Concentrates

- The best way to provide a balanced diet is to feed Lo-Cal or Performance Balancer, to supply those nutrients likely to be lacking in forage without unwanted calories.
- Light Chaff can be fed with the balancer, to encourage chewing, as can small amounts of Speedi-Beet. (1 Baileys mug of dry Speedi-Beet soaked with 5 mugs of water makes half a bucket of beet with fewer calories than a Stubbs scoop of Light Chaff).
- In the less common case where you might need to provide a higher calorie feed to a horse who has or has previously suffered from EMS, please see recommendations on either our Cushing's or Laminitis leaflets (as these will follow the same principles of maintaining a low starch and sugar diet while also increasing calorie intake).

As each horse is an individual, if you have any queries about feeding your EMS equine, do contact a Baileys Nutritionist on  
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nutrition@baileyshorsefeeds.co.uk