

Laminitis is a serious, crippling disease of horses, ponies and donkeys

Laminitis is one of the most serious, crippling diseases of horses, ponies and donkeys. Severe and recurring cases of laminitis can reduce a horse's usefulness or result in the horse being destroyed to prevent further suffering.

Treatment can require a lot of time and money (whether successful or not) and requires a good deal of energy from the carer for an extended period of time.

Recent research has shown a strong association between the high insulin levels seen in most ponies with Cushing's Disease (Pituitary Pars Intermedia Disease (PPID)) and Equine Metabolic Syndrome (EMS) and susceptibility to laminitis; indeed it is now thought that the majority of laminitis cases are PPID or EMS individuals. There is an extremely effective treatment now available for PPID. Please contact for details.

What is laminitis?



Laminitis is a painful inflammatory condition of the tissues (laminae) that bond the hoof wall to the pedal (coffin) bone in the horse's hoof. It can affect any horse, of any age or sex, at any time of the year. Although it is traditionally considered a disease of fat ponies, laminitis can be triggered by a variety of metabolic or physical causes in any horse as discussed in 'Causes of laminitis'.

Laminitis is caused by weakening of the supporting lamina within the hoof, leading to painful tearing of the support structure suspending the pedal bone within the hoof. If laminitis is not treated promptly, the pedal bone drops (these cases are described as "sinkers") or the pedal bone can rotate downwards.

Laminitis and Founder are not the same. Laminitis can, but does not always result in Founder. The word Founder describes the sinking of the horse's foot. The sinking occurs when the laminar bond fails. The laminar bond is made up of two layers:

- The insensitive nonliving layer that grows from the coronary band (comparable to our finger nail).
- This is attached to the sensitive laminae (similar to the sensitive skin under our finger nails), which interlocks with insensitive tissue forming a remarkably strong bond.

The level of pain a horse demonstrates does not necessarily indicate either laminitis or founder. Some horses show tremendous pain while they are laminitic, and others show very little. The same may be true for foundering horses.

What to do if Laminitis occurs

- Treat laminitis as an emergency. Call us for advice
- Initial treatment is critical and can dramatically reduce the likelihood of founder
- Do not exercise your pony. If he is at pasture remove him to a deep shavings bed (10cm+ deep). If he has to travel a distance to a stable use a low loading trailer (medication may be appropriate first).
- After examining your pony we may give painkillers, a peripheral vasodilator - sedative to encourage him to lie down and fit frog supports and give other treatment if appropriate.
- Do not starve your pony as hyperlipaemia may develop. We will advise you on an appropriate diet; this will normally consist of limited forage and high fibre, low starch chopped feeds with plenty of fluids. Usually based on 1% of body weight per day with a balancer.

Causes of laminitis

Laminitis can be triggered by various causes. The most common causes are:

- Excessive intake of grass, grain engorgement
- Sequel to infection. For example a mare that has recently foaled and has retained afterbirth
- Sequel to administration of excessive doses of certain drugs such as corticosteroids (e.g. Prednisolone)
- Enlargement of the Pars Intermedia of the Pituitary gland (PPID or "Cushings disease")
- High insulin levels such as seen in EMS

Less common causes include

- Concussion from riding on hard surfaces
- Excessive weight bearing by one leg due to severe injury or lameness in the opposite leg
- Stress from long distance transport

Effects of Low Grade Laminitis

Subclinical laminitis is the early stage of laminitis where structural changes have occurred within the hoof, without the horse being obviously lame or short in the stride. Subclinical laminitis is a likely cause of the following:

- Prominent growth rings on the hoof wall
- Dished hoof wall with flared out long toes (and often low compacted heels)
- Low grade seedy toe, sub solar haematomas that may lead to an abscess
- Crumbly white line
- Flaky soles and hoof edges broken away
- "Sore feet" in the front feet. More evident particularly on hard ground
- Shortened gait that doesn't improve with exercise and worsens with fast and hard work.

If you recognize any four of the above symptoms your horse may be suffering the effects of low-grade laminitis.

Diet and laminitis

Vets and horse owners alike have long been familiar with the association of lush pasture and laminitis in susceptible equines. Water soluble carbohydrates in grasses are implicated as triggers for dietary induced laminitis. Cereals (grain) contain high levels of starch. Starch has the same effect as the Water Soluble Carbohydrates found in grasses in causing laminitis.

Temperate grasses contain naturally large amounts of carbohydrate (sucrose, fructose, glucose, and fructans). It is the carbohydrate that is rapidly fermented that initiates the cascade resulting in laminitis. In most of Europe, USA & southern parts of Australia, temperate grasses are an important part of the diet of most equines, especially during the period Spring to Autumn. There is an association with high fructan levels and the onset of dietary induced laminitis.

Difficulties lie in predicting Fructan (a soluble carbohydrate) levels at any given point in time. The content of Fructans in grasses is highly variable. The actual amounts of sucrose and fructans vary from 5-50% of total dry matter. Large changes can occur within hours. The accumulation of these sugars is a highly dynamic, variable and environmentally responsive process. Temperate grasses may store 10-13% of their total sugars reserves as starches. This leaves up to 90% being stored as sucrose or fructans. (Water-soluble carbohydrates).

Certain grass species seem to accumulate more fructans than others; perennial ryegrass may contain 12% fructans and cocksfoot only 2%. Temperature effects fructan accumulation, cold sunny days mean a high level of fructan accumulation. Grass stores more fructans in its stems than in its leaves so horses turned out on stubble after a hay crop can be eating a relatively large amount of fructans, conversely well managed fields which are grazed by sheep or cut will have a high leaf to stem ratio and potentially less fructans. Fertilisers should be avoided wherever possible.

International research has suggested that there is an interrelationship between diet, hindgut acidosis and low-grade laminitis.

Prevention of Dietary Induced Laminitis

"PREVENTION IS BETTER THAN CURE"

Restricting the pony's intake of lush green grass and grain can reduce the rate of lactic acid production. Easy to say, however in practice a pony in a field as sparse as a pool table can still suffer dietary induced laminitis.

Digestion of carbohydrates in Equines and its relevance to dietary induced laminitis.

Lush green grass, which carpets the countryside particularly in spring and autumn, or feeding high levels of grain, can induce laminitis in horses. This information is well known amongst horse owners and riders.

The first step is to understand what components of the horses diet create the risk of laminitis. What do grains and lush pastures have in common? Cereal grains contain abundant amounts of Starch a form of carbohydrate that is broken down to simple sugars such as glucose in the digestive tract. Lush green grass can have high levels of sugars that are directly available in the digestive tract.

- GRAIN contains Starch that are converted to Simple Sugars
- LUSH GRASS contains readily available Sugars

How does the horse usually digest its food?

This question provides us with the key to the cause of dietary induced laminitis. The horse digests its food in two ways

- Simple digestion. Once the food has been eaten it is digested by enzymes in the first part of the digestive tract. The nutrients are then absorbed from the digestive tract.
- Hind gut fermentation. Excess sugars and complex carbohydrates which require longer to digest move onto the large bowel for fermentation.

Normally the bacteria ferment away slowly and horse absorbs the products from the bowel for use as an energy source. Excessive sugars arriving in the hind gut trigger laminitis when the absorbed sugars lead to hyperinsulinaemia especially in susceptible individuals.

Why is there so much variability in the incidence of laminitis?

- The amount of sugars present in pastures. Warm clear days and cool nights provide the ideal conditions for build up of sugars - particularly when there has been rain and growing conditions are good.
- Variation between animals. The risk depends on how much they eat, how quickly they eat, how efficiently they digest their feed prior to fermentation, what breed they are etc.
- Individuals with PPID and/or EMS with corresponding high basal insulin levels are far more susceptible.

MANAGING LAMINITIS - Minimising the risk

(1) FEEDING GUIDELINES:

- Feed a forage based diet. Feed a mixture of mature grass and hay with alfalfa (Lucerne). Alfalfa contains essential minerals and proteins that the horse can utilise to improve hoof quality. Unless horses are in hard work they do not require hard feed. For extra calories use vegetable oils. Please ask our advice regarding quantities.
- Feed a high fibre diet e.g. hay made from mature flowering grasses but ensure that adequate water is consumed to avoid the risk of an impaction colic. Soaking hay for two hours will assist water intake and also leach out some of the protein and carbohydrate.
- Manage grazing carefully. Do not turn laminitics out in the frost or on very stressed or bare paddocks. Grass is safest at night when sugar levels are in decline. The later in the evening the better. Strip grazing may be a safe alternative. Pick up all droppings to reduce pasture spoiling and risk of infection with parasitic worms. Consider cross grazing with sheep.
- Avoid Bran. Due to its high phosphorus levels feeding over a long period will result in relatively low levels of Calcium, one of the important minerals for hoof health.
- Avoid lush grass pasture, cereals and coarse mixes.
- Use a quality Vitamin and Mineral supplement. If your pony has poor hoof structure the use of Farriers Formula should be considered.
- Changes to the diet need to be gradual. Feed little and often.

(2) BODY WEIGHT:

An overweight pony has a higher risk of laminitis. At ideal weight you should be able to feel your horse or pony's ribs but not see them and they should have no crest on the neck or gutter along the back. It helps to ensure that your horse or pony is in the correct bodily condition before you turn out in the spring as you cannot diet a horse on grass! Exercise in overweight ponies (without laminitis) is the most effective way to control bodyweight. Never starve a laminitic horse as this can lead to death through hyperlipaemia.

(3) HOOF HEALTH:

Regular trimming and correct foot balance are essential for healthy feet. Specialist shoeing can assist - please contact us to discuss whether this is appropriate.

(4) GENERAL HEALTH:

- Monitor your horse following medical conditions such as colic or retained placenta in mares. These are high-risk causes.
- Turn out in sand arenas for exercise each day. Please note that ponies that eat sand may develop sand colic - a muzzle should be used on these cases.

(5) WORK:

As concussion can also cause laminitis avoid excess work on hard surfaces, such as hunters working on hard roads in winter and ponies working on hard surfaces during summer shows and Pony Club Camp. Feed according to work. Any form of stress may predispose the horse to develop laminitis. When stressed, animals respond by releasing corticosteroids from their adrenal gland. Alterations in the blood flow to the feet can then lead to a laminitic episode.

(6) TEST FOR PPID and Insulin resistance:

A very high proportion of ponies suffer from insulin resistance due to EMS and PPID. Insulin resistance can be tested for by a blood glucose assessment 2 hours after a feed (with 1g/kg bodyweight) following a 12 hour fast. There is an accurate blood test for PPID and effective treatment for most cases; please contact us for details.

Glossary of terms

Cellulose - A carbohydrate (sugar) forming the skeleton of most plant structures and plant cells.

Fructan - a collective of oligosaccharides, polysaccharides, chains of fructose molecules.

Hypothyroid - A medical condition where the thyroid function is less than normal.

Keratin - A protein that is the principle component of skin, hair and nails.

Lactic Acid - a compound formed in the body by metabolism of carbohydrates or by fermentation of carbohydrates.

Lactobacillus - a genus of gram-positive rod shaped bacteria. They produce lactic acid by fermentation. In doing so they play a part in the development of lactic acidosis in the hindgut of horses.

Laminitis - an inflammatory condition of the sensitive laminae of the hooves. Characterised clinically by mild to severe lameness especially of the front hooves. There is heat and pain at the coronets and in bad cases the pedal bone can penetrate the sole of the hoof.

PPID - Pituitary Pars Intermedia Disease ('Cushing's Disease')

EMS - Equine Metabolic Syndrome

Credits and Links

Talk About Laminitis

www.talkaboutlaminitis.co.uk

Condition Scoring - BHS Leaflet

www.bhs.org.uk

Explaining Laminitis and its Prevention

www.laminitisclinic.org

Imprint shoeing system

www.imprintshoes.co.uk