

Feeding After Laminitis (Founder)

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Many horse and pony owners battle for months to restore the hooves and improve the gait following a bout of founder. Horses and ponies that have suffered a single, or recurring episodes of laminitis or the more serious structural hoof changes associated with pedal rotation as in founder, require careful dietary management to reduce the risk of further bouts of founder and to promote the regrowth of affected hooves. A prior episode of founder increases the likelihood of further episodes as hoof circulation can be compromised.

Managing to Prevent Laminitis

There are a number of important aspects of feeding and feeding management to reduce the risk of repeated laminitis. Many overweight ponies become insulin insensitive which increases the risk of repeated laminitic episodes. There are a number of management aspects that should be adopted to help prevent an initial episode, or reduce the occurrence of chronic seasonal laminitis, especially in horses and ponies grazing green pastures in the Spring and Autumn.

The Underlying Cause

Early Spring Founder

Winter grasses that are boosted in growth by warmer Spring conditions (cool nights and warm days) often become lush and highly productive. Dominant lush pastures in the early spring are likely to produce large amounts of non-structural carbohydrates (NCS) as fructan sugars. Horses do not secrete an enzyme in their small intestine that can digest the chemical bonds in fructan sugars to release glucose, so that large amounts can be overloaded (dumped) into the voluminous hindgut. Fermentation bacteria can break the bonds, with secondary production of D-lactic acid, a non-absorbable, non-metabolisable acid which accumulates in the hindgut digestive mass. This acts to lower the pH and suppress normal fermentation, with the death of large numbers of hindgut microbes and damages the hindgut lining. A toxin is also produced by the lactic acid producing bacteria and other dying bacteria, that when absorbed into the blood stream, circulates to the hooves to interfere with the blood supply to the lamina and devitalize the basement membrane attachment of the laminae. The weakened lamina attachments are then torn apart by the continuous downward rotation “pull” of the deep flexor tendon on the pedal bone.

Late Spring and Autumn Founder

Pastures that regrow after rain under warm conditions can store large amounts of NSC carbohydrates, which can be digested in part in the small intestine to cause “spring fever” or excitement, as well as overload into the hindgut and risk of laminitis or founder.

A similar process occurs when horses consume excess grain starch from high grain rations or greedy eating habits, or are ‘grained up’ too quickly in early training.

Many older and overweight horses develop glucose intolerance (secondary diabetes) and insulin resistance, which increases the risk of sugar overload and laminitis.

Steps to Avoid Laminitis

The management goals in preventing ‘grass’ founder should be observed from the start of spring or following late summer rains, when pastures are likely to grow rapidly and produce either fructan sugars (spring pastures), or high soluble carbohydrates that overload into the hindgut of grazing horses (autumn pastures).

1. **Restrict access to lush spring pastures** to 1 ½ hours in the early to mid-morning (after the dew has dried off) and again in the mid to late afternoon, as the peak production of fructan sugars in the leaves of the plant from sunlight photosynthesis occurs over the late morning to mid afternoon period.
2. **Do not leave susceptible horses and ponies out to graze overnight** during cool nights or on lush pasture. Although the concentration of fructan sugars in the leaves decreases at night as they are transferred to the plant stems, horses and ponies often instinctively graze in the early evening and can take in large volumes of grass.

Even if hay is offered in the evening to reduce the desire to graze, many horses and ponies will instinctively graze after consuming hard feeds and hay.

3. **Always soak good quality grass hay**, eg. grass and clover hay grown in early spring containing high levels of fructan sugars or soluble carbohydrates, for 1 hour in double its volume of lukewarm water. Remove and air dry and drain away the water. Do not add the soaking water to the feed. Ensure that the hay is free of mould or a “musty” smell for up to 60 minutes after soaking or until it is dry. A polywoven chaff bag is a suitable soaking bag to reduce leaf loss.
4. **Offer chaff or ‘soaked’ hay before turning out to graze in the early morning or late afternoon** to fill the stomach and limit the rate of fill when grazing as well as dilute the intake of fructan grasses.
5. **Consider the daily use of Virginiamycin (Founderguard)®** to suppress D-lactic acid producing bacteria and the cascade of damaging bacterial toxins during high risk periods, or a Foundermask to limit grazing.
6. **Regular exercise** in ‘cresty’ overweight ponies, that are insulin insensitive, can help reduce the risk of laminitis by utilizing more glucose on a daily basis.
7. **Maintain short toes by ensuring the horses/ponies hooves are trimmed every 3-4 weeks** so that there is less rotational force on the pedal bone on any devitalized laminae that are coping with the effects of circulating toxin. Long toes increase the deep flexor tendon downward rotation force on the pedal bone in standing animals, especially overweight horses with low heels as a result of chronic laminitis.

Management after Laminitis

Besides adopting the restricted feeding management program, horses and ponies recovering from laminitis must be provided with a diet that will not only minimise the risk of recurrence, but also allow regrowth of a sound hoof structure.

Dietary Management

Any risk of excess starch intake that could trigger a recurrence must be prevented. Chronically foundered horses and ponies are best managed by restricting grazing and feeding a low starch ration. The ration base should include low sugar (low glycaemic) feeds to minimise the risk of soluble carbohydrate overload from non-structural carbohydrates (NSCs) in spring harvested grass hay or even oaten chaff.. Many veterinarians recommend feeding grass hay or oaten chaff or hay, as well as straw, to horses and ponies recovering from laminitis and founder. However, good quality grass hay can contain fructan sugars (spring harvest) or NSC carbohydrates (late spring, summer, autumn harvest) in a concentrated form (10% moisture) which overloads into the hindgut. All types of grass hay and clover hay (including ‘sweet’ oaten chaff and hay) should be soaked for 1 hour in lukewarm water to leach out soluble sugars (as explained in Point 3 above). Unfortunately, grass hays and chaff have poor quality protein that does not provide an adequate intake of amino acids (lysine, methionine) for hoof regrowth after founder. **Lucerne hay has higher protein and a lower level of NSC, but in large amounts in excess of 1kg/100kg it can overload excess into the hindgut to trigger laminitis – it must be soaked as well.** Horses rely on protein uptake from feed during digestion in the small intestine and have a limited ability to utilise bacterial protein produced during hindgut digestion. Therefore good quality protein, containing adequate methionine for hoof regeneration, should be given, such as full fat soyabean meal, and cracked lupins (1 cup/200 kg body weight) and lucerne chaff/hay in limited amounts.

Note:- Although clover hay contributes protein, avoid feeding large amounts as it can also contribute carbohydrate NSC sugars – lucerne has a lower carbohydrate content. (low glycaemic)

Low Starch Foods

These include wheat and rice bran (has more energy) pollard (limited amounts) and compounded feeds such as Equi-Jewel (which provides calcium, zinc and selenium) and vegetable oil such as **Energy-Gold®** (15-30ml/100kg) as a “cool”, non-starch energy source. Equestrian pellets, horse and pony cubes are usually low in soluble fermentable starches and can also be used as an energy source. Avoid feeding extruded or micronised grains or feeds as these can make a horse more excitable. Check the label for ingredients – avoid cereal grain based feeds. **Remember: Soak good quality spring hay to remove soluble sugars, see point 3 above.**

Hoof Growth Aids

Protein supplements containing methionine, as well as calcium, zinc, Vitamin A and biotin are useful to promote hoof regrowth (Biotin (vitamin H) supplements with a well formulated trace-mineral and vitamin supplement, such as Kohnke’s Own **Cell-Provide®** (contains calcium as well) or **Cell-Vital®**).

Remember, dietary management, regular exercise and hoof trimming to maintain short toes is paramount to preventing repeat episodes of founder.