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Laminitis in horses; nutrition & management (part 2)

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Spring is upon us! This is the time when owners of horses that are sensitive for developing laminitis are starting to worry about the well-being of their horse.

In part 1 of the laminitis series we explained the disease and the dietary, metabolic and endocrine pathways that can trigger laminitis. In this article we describe the nutrition and management of obese, insulin-resistance (IR) and laminitis-prone horses.

Laminitis may be considered as a systemic disease and the mechanisms that are involved in the onset of laminitis may be the result of a variety of pre-existing problems elsewhere in the body of the horse. Excessive intake of non-structural carbohydrates (NSC), obesity and insulin resistance appear to be related and the most common cause of laminitis in ponies and horses that are kept on lush Spring pastures.

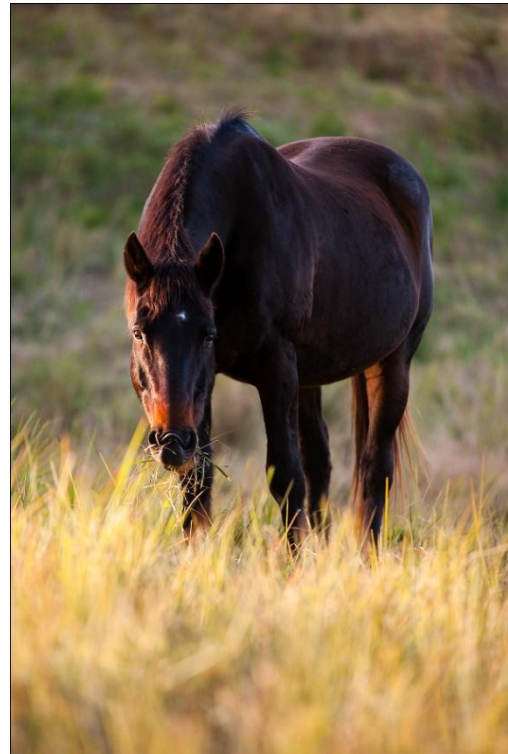


Photo by Craig Mackintosh www.wildimages.eu

Diet pasture?

Warmer temperatures and longer days trigger the growing season. Pastures become lush and store more sugars for growth. Between grass species there can be a difference in how they store their sugar reserve and how much they accumulate.

Grasses can be classified as either C3 or C4 plants. These terms refer to the different pathways that plants use to capture carbon dioxide during photosynthesis. C3 and C4 grasses have different growth requirements. C3 plants are adapted to cool season areas and grow in either wet or dry environments. On the other hand, C4 plants are more adapted to warm or hot seasonal conditions under moist or dry environments. Both the grass types have internal structure to support the different types of metabolism. C4 grasses form starch and C3 grasses generally form fructan as their storage carbohydrate, but there are some C3 grasses that evolved and store starch instead of fructan. There a number of Australian native grasses such as weeping grass, kangaroo grass and wallaby grass that are of the C3 type, but produce starch and no fructan. Both C3 and C4 grasses have a risk of causing laminitis in horses due to overload of soluble sugars, non-structural carbohydrates (NSC), or starch during active growth periods, especially in horses that are "easy keepers". Between C3 and C4 species there is difference in how much they tend to accumulate in optimal growth conditions. C3 grasses/legumes, such as ryegrasses, clover and paspalum and C4 grasses such as, kikuyu,

couch grass, early growth Rhodes grass and panic grass have high potential to accumulate NSC. Many Australian native grasses are lower in sugar and fructan. These include red grass, weeping grass, speargrass, Kangaroo grass and Wallaby grass.

Because these native species have lower sugar content, they may be less preferable than sugary grasses or weeds. Creating paddocks that have good cover of the mix of native grasses will reduce the growth of more temperate or tropical grasses with high potential to accumulate NSC. Native grasses need to be managed carefully as they are more sensitive to overgrazing. There are also some commercial grass mixes for horses on the market. Review if the grass species (mix) are suitable for your environment/climate and that they are not dominated by grass species that have high potential risk of accumulating NSC.

Grasses not only produce more NSC during the growing season, when grasses are under stress (heat, drought, cool temperatures, overgrazing) they may also accumulate NSC to survive. Environmental conditions determine the concentration of nutrients in your grasses, and it is therefore impossible to protect your horses fully from those periods with high NSC accumulation. Horses at risk need proper management while grazing on pastures.



C3 type native kangaroo grass

“Safer” grazing & management

Establishing and sowing new “safer” grass mixes is not for every horse owner or environment possible. They rely more on additional feeding and management.

The nutrient composition and NSC concentration in grasses varies, depending on the environmental conditions. During the day and when sunlight is present grasses contain more NSC, then during night, in the shade or when the weather is overcast. It is therefore “safer” to graze your horse in the early mornings and in shaded areas.

There are various management strategies to reduce the intake of grass and minimise the risk of pasture associated laminitis. You can limit the grazing time of your horse, by turning your horse out at certain times of the day. The rest of the day your horse can be kept in bare sacrifice areas with a shelter or shade. Other options are muzzle grazing or strip grazing. When you own a laminitis-prone horse, you have to make management sacrifices. Not everybody likes the idea of muzzle grazing, but it may help reducing the intake. Strip grazing can also manage the intake. By using portable electric fences you can move the fence to new areas. You should not overgraze the strips, as this stresses the grass and encourages NSC to accumulate for survival.

Rotational grazing is very important to give the grass some rest for regrowth. If possible split your pasture in a number of paddocks, so you can manage your grass by rotating between the paddocks. You would like to have your paddocks kept in vegetative stage of growth. The leaves of grasses are lower in NSC than the stems and heads. Therefore, with overgrazing as well as with too much short mowing you will select for plants that are high in NSC. By moving or slashing only the heads, you allow leafy regrowth and reducing seeds

head to develop. Managing your pastures for reducing NSC concentrations requires some knowledge about grass morphology and pasture management. Below you find some more information about this topic.

Additional feeds & management

If you reduce your horse's access to pasture, your horse needs to be offered additional feeds. When selecting a hay/chaff variety you should review the nutritive value. In particular the NSC of hay/chaff should be analysed to determine if it is suitable for horses with a metabolic disorder such as Cushing's disease, insulin resistance, obesity and laminitis. As mentioned above some variety of grasses under certain environmental condition can accumulate more NSC than others. Although average roughage values from literature can assist you with selecting your roughage, the actual concentrations may vary. Soaking hay in water may reduce some of the NSC, but shouldn't be relied on as left over sugar concentrations may vary.

Other fibres (structural carbohydrates) feeds for laminitis-prone horses can be hulls, such as soybean and lupin hulls, and fibres foods such copra meal and beet pulp. They are not used as a full replacement of traditional roughages but more to supplement the diet to increase fibre intake. In the August 2010 edition of Horses & People Magazine (Back 2 Basics; Choosing roughage) you can find more information about selecting roughage and nutritive value of some roughage products.

In general you would like to feed your easy keeper or laminitis-prone horse a high fibres diet with reduced NSC concentrations. In addition you may need to supplement these horses with a vitamin and mineral premix, as they don't receive enough fresh forage.

Many commercial feeds are based on cereal grains, which should be avoided in the diet of laminitis-prone horses. Unfortunately not all commercial horse feeds state NSC or starch contents on their bags as this is not obligatory. Review the ingredients before choosing your feed and for more nutritional advice contact an equine nutritionist to help you out with your dietary management of your horse.



Selecting a high fibre roughage low in NSC

Exercise

Horses at risk, that tend to become obese and/or are IR, benefit from exercise. Reducing the intake of energy and exercising more aids weight loss. You should gradually reduce/change the diet and start the exercise program. Try not to change the horse's weight too rapidly, but aim for no more than 0.5% of the body weight per week. Best is to establish a weight loss program with your veterinarian and/or equine nutritionist. It is important to have realistic goals and set a target weight. Monitor your horse's weight at a regular basis during the weight loss program. Once your horse reaches the target weight, maintaining a proper diet and regularly exercise is essential to keep your horse fit and healthy.

If horses recover, you can gradually introduce a "safer" diet and start with a walking program

when there is no pain in the foot. Depending on the severity of the disease and recovery, the exercising program can be gradually increased. This needs to be monitored by your veterinarian. For more information about the subject see references and for practical pasture management and nutritional consultations contact MB equine nutrition consultancy.

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Internet: <http://www.horsesandpeople.com.au/>. Nutrition articles: Back to Basics; Choosing roughage (quality versus quantity).

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