

# Laminitis & Nutrition

## and Paying Attention to pH



“The pain can be compared to tearing your fingernail away at a 45 degree angle but then the horse is asked to walk on that painful foot,” explains Equine Nutritionist Don Kapper.

Photo: Barbara Sheridan Photography



When laminitis occurs, an incident has affected the quality of the laminae in the foot. It has been torn and the coffin bone may rotate. This can range in severity. One cause is overfeeding starch found in cereal grains (oats, corn, barley, wheat, rice) or fresh, immature pasture.

In the spring and fall, when there is frost present at night, the sugar is stored in the grass. When horses go out in the morning and consume large amounts of this pasture (now rich in non-structured carbohydrates) they are at greater risk for laminitis.

“Nutritionally, it is critical to ensure the pH of the digestive system is at optimal,” says Kapper. Normal pH of the cecum is 6.7 – 6.8. When the pH drops to 6.5, this is referred to as acid gut syndrome and it is accompanied by a loosening of the stools. An acid smell will also be present in the feces. If pH reaches 6.0, laminitis will occur in 80 percent of horses. If a horse is laminitic, eliminating high starch and sugar content cereal grains will help maintain a normal pH in the cecum.

Using a ration balancer, which will be low in non-structured carbohydrates, is an ideal way to feed proteins, minerals and vitamins to horses prone to laminitis. Depending on the weight of the horse, the balancer can be fed at one to two pounds a day and meet all of their needs to complement their grass or mixed forage intake without having a negative effect on the cecum.

Forages also play a role in pH. Analysis can be done for non-structured carbohydrates for starches and sugars. New technology also allows testing of structured carbohydrates for water soluble carbohydrates (WSC) and ethanol soluble carbohydrates (ESC). In a laminitic horse, it is the WSC plus starch that requires monitoring because that measures starch plus fructans (present in cool season grasses). Fructans are not found in legumes, warm season grasses or grains. Fructose is a large molecule sugar that cannot be broken down and absorbed in the small intestine. It has to go all the way to the fermentation vat (cecum) to be released and this is where it will affect the pH of the cecum.

Feeding forage ad-lib will result in the production of saliva – one of the best buffers for the horses' digestive system and the most effective way to control PH. “Horses are designed to be continuous feeders,” explains Kapper. An 1100 pound horse will eat up to 18 hours a day consuming about 2 – 2.5 % of their body weight per day in dry forage. This will produce between 25 to 30 gallons of saliva, significantly reducing the chances of acid gut syndrome and improving nutrient absorption and overall health.

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Feeding the best choice of ad-lib forage, minimizing starch intake and analyzing the structured and non-structured carbohydrates can help laminitic horse owners maintain a balanced pH for happy cecum's and healthy horses.



**Don Kapper** is a highly experienced equine nutritionist and a member of the Cargill Equine Enterprise Team. Don graduated from Ohio State University and achieved his credentials as a Professional Animal Scientist from the American Registry of Professional Animal Scientists in 1996 and has been a sought-after speaker for equine meetings in both the U.S. and Canada. He was a member of the “Performance Electrolyte Research” team at the University of Guelph and wrote the chapter on “Applied Nutrition” for the authoritative veterinary textbook: *“Equine Internal Medicine”*, 2<sup>nd</sup> edition.

Don also co-developed the “Equine Nutrition” course for the Equine Science Certificate program for Equine Guelph and has been a popular guest speaker in several Equine Guelph online courses, including the Equine Growth and Development, Exercise Physiology and Advanced Equine Nutrition. Learn more about online courses for horse caregivers at the [Equine Guelph education web page](#).