



FEED FOR THOUGHT

NSCS: WHY ARE THEY IMPORTANT?

WHAT ARE THEY?

In the last ten years, nonstructural carbohydrates have gone from something described in a handful of scientific articles to one of the most talked about aspects of equine nutrition. Nonstructural carbohydrates or NSCs are the summation of simple sugars, starches, & fructans within a feedstuff & are often expressed as a percentage of the total dry matter of the feedstuff in question (Hall 2003). Sugars & starches are the readily available energy sources found in a variety of grains & forages. Meanwhile, fructans are chains of the simple sugar fructose that are produced by cool-season grasses, such as timothy or orchard grass, when under stress & can be used as potent prebiotic additive in minute quantities in the form of fructooligosaccharides (FOS).

The reason NSCs have come to prominence is because high levels of NSCs in forages, particularly cool-season pastures, have been tied to an increase of insulin resistance &, subsequently, potentially life threatening laminitis in horses (Longland & Byrd 2006). The problem, though, is that many horse owners are misguided in their hunt for low NSC feedstuffs & often ignore the biggest factor in the equation: your hay. While feed bags come with convenient labels that state exactly how much starch & sugar is in your grain, hay requires the horse owner to gather a randomized sample of their hay, send it in to a respected laboratory with payment, wait 1-3 weeks, & then interpret the results. Then, this has to be repeated every time your farm receives a new batch of hay because even short term environmental factors, such as sunlight, rain, excessive temperature changes or even the time of day the hay was cut, can dramatically change the amount of sugar present between one load of hay & the next one. For metabolically abnormal horses, regular forage testing could (at the risk of sounding melodramatic) be the difference between life or death.

It is important to look at the entire ration & recognize that high NSC hay coupled with low NSC feed can still be devastating to horses with metabolic issues. Again, the high NSC values are particularly

true for cool-season grasses while warm-season grasses, such as bermuda grass, do not vary as greatly from one cut or season to the next (Waite & Boyd 1953). While at first glance, the average NSC values for bermuda grass & timothy seem similar, at 16.5% & 19.5%, respectively, Bermuda grass is recorded as having a maximum of only 25.5% NSC, while Timothy can go as high as 32.9% NSC (Dairy One 2005). Teff grass, another warm-season grass, consistently remains below 10% NSC (Stanjar et al. 2010). Warm-season grasses also tend to store excess carbohydrates in the form of starches instead of simple sugars or fructans, which seems to have a lesser impact on both insulin resistant & laminitis-prone horses.

The general consensus, though, is that the NSC levels of the entire diet should be monitored through testing of hay & choosing appropriate concentrates. For horses battling chronic laminitis, the best approach is to feed a low calorie, low quality warm-season hay (e.g. teff grass hay) coupled with a high quality vitamin & mineral nugget (e.g. Cavalor Nutriplus) to meet the daily nutrient requirements of the horse &, in particular, to encourage quality hoof growth (Hood 1999).

What about the metabolically normal or performance horse? More on that soon!

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