

Why hay soaking is not a reliable way to reduce sugar content

Definitions:

NSC = Non Structural Carbohydrates

WSC = Water Soluble Carbohydrates

ESC = Ethanol Soluble Carbohydrates

NSC = WSC + starch

WSC = ESC + long chain fructans

ESC = simple sugars + short chain fructans

Or to put it another way:

NSC = simple sugars + short chain fructan + long chain fructan + starch

(.....ESC.....)

(.....WSC.....)

Soaking hay before feeding has become common practice among horse owners wanting to reduce the 'sugar' content of their hay in the belief that it will help control weight and reduce the risk of laminitis. This is a high risk strategy as soaking may not remove enough of the right sugars to prevent hyperinsulinemia and subsequent laminitis (Asplin *et al*, 2007) in at risk animals such as overweight, EMS or IR or PPID (Donaldson *et al*, 2004; Karikoski *et al*, 2011)

Feeding hay with Non Structural Carbohydrate (NSC) content of 10- 12 per cent Dry Matter (DM) or 8 -10 per cent DM Water Soluble Carbohydrates (WSC) has been advocated for EMS cases (Mack *et al* cites Frank 2009, Frank *et al* 2010) but this approach ignores the glycaemic response to sugars, most importantly, glucose and fructose. A popular commercial chaff based forage with 10% WSC still raised blood insulin levels by 5-10 times above normal levels in normal and laminitis prone ponies (Borer *et al* 2012). In the same trial, glucose and fructose - fractions of ESC - significantly both elevated insulin levels more than fructan (Borer *et al* 2012), so ESC levels not WSC must be monitored in order to select hay lots with a lower risk of triggering hyperinsulinemia. An upper limit of 10% combined sugar (ESC) and starch has been suggested as best practice for managing horses and ponies with metabolic disorders such as Cushings, EMS, IR and laminitis [www.ecirhorse.org accessed 3 July 2016]. This seems realistic, as reducing levels below a combined ESC + starch of 7.6% did not reduce the glycaemic response in normal horses and was not considered beneficial (Lynn 2015 unpublished).

Soaking may never render some hay 'safe' if insufficient ESC is removed. The amount of WSC and ESC fractions removed by soaking can vary significantly between hay lots. Even after soaking different hay lots for 16 hours at 8° C, the amount of WSC removed varied from 6 - 54% while the amount of glucose removed varied from 29 - 100% and fructose varied from 21 - 70% (Longland *et al* 2011). Unless the hay is analysed post soaking and prior to feeding, its nutritional profile and its suitability cannot be assessed.

Ultimately, if the nutritional value and profile of hay **as fed** is not known, then the hay cannot be assumed to be 'safe'. Correct sampling and a full analysis to determine ESC and starch content is the only way to ensure that hay has the correct nutritional profile to keep blood glucose and insulin within normal limits.

Hay such as Feetfirst Hay, that has been sampled and fully analysed according to industry guidelines and has less than 10% combined ESC and starch should not need soaking [www.ecirhorse.org] at all. Soaking this hay to reduce glycaemic response will be a waste of time and resources. It can however be a useful temporary management tool to reduce total WSC and therefore calorie content if weight loss is required while maintaining forage intake at the recommended 1½ - 2% of bodyweight per day. Once the target weight loss has been achieved, Feetfirst Hay can be fed un-soaked as normal.

Simple* Reliable* Flexible



Hilary Snow

Feetfirst Hay, 16 July 2016

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