HAYGAIN
hay steamers

Experiment 12

Moore-Colyer MJS, Lumbis K, Longland AC, Harris PA. (2014).The effect of five different wetting treatments on the water soluble carbohydrate content and microbial concentration in hay for horses. *Plos One.*

Introduction: Ingestion of high levels of water soluble carbohydrates (WSC) by horses from either forage or cereal based feeds increases the risk metabolic disorders such as insulin resistance, equine metabolic syndrome (EMS) polysaccharide storage myopathy (PSSM) and laminitis. Hay or forage replacers with WSC level < 100g/kg DM are best for such animals. WSC levels in UK hays are commonly between 100 and 310g/kg DM. Recent research has shown that soaking hay increases the bacterial content of the fodder and this could compromise the health of the horse (Moore-Colyer and Fillery, 2013). The aim of this study was to measure the effect of soaking, steaming and a combination of both treatments on the WSC content and microbial contamination of 5 different UK hays.

Materials and Method:. Five different hays were used to determine the effect of 5 different soaking and steaming treatments on the WSC and microbial contents of UK hay. Hays were subjected to the following treatments: Dry (D), steamed for 50 minutes in the HG 600 steamer (S), soaked in water at 16^{o}C for 9 hours (W), steamed then soaked (SW) and soaked then steamed (WS). Post treatment hays were tested for WSC, bacteria and mould. Differences between means were determined using ANOVA and least significant difference with hay (5), bale (3) and treatment (5) as fixed factors, thus n = 75.

Results: W, SW and WS treatments were all equally effective at reducing WSC with significantly ($P<0.05$) lower mean contents (79-83g/kg DM) compared with the 126 and 122 g/kg DM for D and S respectively. S and WS had significantly ($P<0.05$) less bacteria (1046 and 490 cfu/g DM) compared with W which increased cfu/g DM from 60256 in D up to 354813. Mould contents cfu/g DM were significantly ($P<0.05$) reduced by S (2) and WS (1.9) but no difference was seen between D (1148), W (692) or SW (501).

Discussion. Steaming increased the moisture content across all of the hays 2 fold and soaking by > 5 fold. The mean loss of WSC with S was only 3 % whereas soaking caused an average WSC loss of 34% (range 23% to 53%). Submerging hay in water caused rapid and extensive proliferation of bacteria up to 5 fold and this could compromise the health of the horse. S and WS on the other hand reduced ($P<0.001$) the cfu/g of bacteria by 98 – 99%. Soaking hay for 9 hours followed by steaming for 50 minutes in the Haygain steamer was the most effective method for reducing both WSC and microbial contamination in hay. Soaking or steaming + soaking lowered WSC but significantly reduced the hygienic quality of the hay which could potentially compromise the health of the horse.