

Experiment 6

Moore-Colyer, M.J.S and Fillery, B.G. (2012) The Effect of three different treatments on the respirable particle content, total viable count and mould concentrations in hay for horses. 6th European Workshop for Equine Nutrition, Lisbon, Portugal, June. 101-106.

Introduction: Many horse owners soak hay to reduce airborne particles, but soaking is laborious, leaches nutrients (Moore-Colyer, 1996) and the resulting post-soak liquor is an environmental pollutant (Warr and Petch, 1992). In contrast, steaming hay in the HG 1000 has been shown by Stockdale and Moore-Colyer (2010) to reduce respirable particle numbers by 91% and fungal colony numbers by 98% (James and Moore-Colyer, 2010). However, the HG 1000 is too big for many owners and accordingly Propress Equine Ltd has produced the HG 600, a smaller version which steams half a bale and works on the same principles as the HG 1000.

This study sought to compare the efficacy of the smaller steaming chamber in the HG 600, at reducing respirable particle numbers, bacteria, and mould concentrations in five bales of poor-quality perennial rye grass (*Lolium perenne*) hay and to compare steaming with dry hay and hay soaked in water for 10 minutes.

Method: Five replicate bales of barn-stored *Lolium perenne* hay made in Hungerford, June 2011, were treated as follows: Half was steamed for 40 minutes in HG 600. Two 4-6kg hay nets were weighed from the other half. One net was soaked in tap water (15⁰C) for 10 minutes then drained for 10 minutes. Post treatment 1g from dry, soaked and steamed hay were weighed into separate stomacher bags with 79 ml of maximum recovery solution and processed for 2 minutes. Sequential dilutions were prepared down to 10⁻⁴. Two x 1 ml from each were placed onto 2 x 3 MTM petrifilms, (3M Microbiology, St Paul, MN 55144-1000), and incubated for 3-5 days at 20⁰C (mould films) and 32⁰C (bacteria), before counting using a standard colony counter. RP were determined according to the method of Moore-Colyer, (1996). Differences between treatments were determined using ANOVA on log transformed data.

Results: Table 1. Geometric mean numbers of respirable particle (RP), total bacterial colonies (TVC) and mould colonies (Mould) from 5 bales of hay steamed for 40 minutes in the HG 600 (steamed), soaked for 10 minutes in water (wet) and dry hay (dry).

	Dry	Wet	Steamed	s.e.d	Sig
RP (/1 air/kg DM)	1327 ^a	0 ^b	1.47 ^b	1.719	P<0.001
TVC /g	21,877,616 ^a	37,153,522 ^a	83,176 ^b	2.55	P<0.001
Mould /g	1,174,897 ^a	316,227 ^a	1,072 ^b	1.97	P<0.001

^{abc} Values in the same row not sharing common superscripts differ significantly (P<0.001)

Conclusions: Steaming in the HG 600 was the most effective treatment for reducing RP, mould and TVC concentrations. Soaking reduced RP but increased TVC and thus cannot be recommended as a treatment for improving the hygienic quality of hay.