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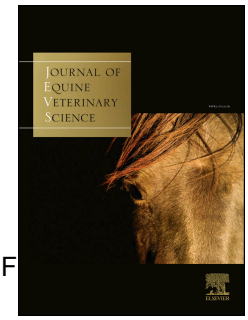

Comparison of NIRS and wet chemistry methods for the nutritional analysis of haylages for horses

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Comparison of NIRS and wet chemistry methods for the nutritional analysis of haylages for horses

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Abstract

Haylage (DM 51-85%) is one of the most common forages fed to equids in Europe. The aim of this study was to assess the repeatability and reliability of the nutrient concentrations in haylage determined by either near-infrared spectroscopy (NIRS) or traditional Wet chemistry methods (WCh) in a single commercial laboratory. To assess this within methods, one single representative sample from one bale of haylage was split into 10 separate samples for analysis by both methods. A further 25 separate haylage bales from across the UK were subsampled at source (blind) and some further divided at the laboratory. In total 52 haylage sub-samples were analysed using both NIRS and WChem, to measure organic matter, crude protein, ammonia (n=34), crude fibre and fat (n=45), ADF, NDF, ADL and sugar content (g/kg DM). For the subsamples from one single sample (n=10), apart from ammonia and sugar, the coefficient of variance (%cv) within each method was very low showing good reliability (%cv: NIRS 3.4 ±2.1; WCh 3.6±2s.d.). Mean variation was 15.4 vs 15.0% for sugar and 29 vs 4.6% for Ammonia for NIRS and Wchem respectively. Between the WCh and NIRS methods, the analytical value for sugar could vary by up to 20%. Overall, there was a strong correlation between the analytical methods for all measures (R^2=0.80-0.91, $p<0.001$, Pearson Correlation), with the weakest correlation being for fat and ammonia. The wide range of measures for what was designated as sugar in samples from the same original bale, regardless of the method used, requires further investigation.

Keywords: NIRS, Wet Chemistry, Haylage, Forage-Analysis, Sugar

Highlights:

- We compared NIRs and WChemistry Analysis for Nutrients in 52 haylage samples
- There was strong correlation for all measures between these two analytical methods
- Sugar analysis showed variation within both methods for same samples
- Ammonia Analysis and Fat analysis showed the weakest correlations
- Further research on this is required with a view to 'low WSC' recommendations