

A Descriptive Study of the Mineral Content of Conserved Forage Fed to Horses in the United Kingdom, Ireland, and France

Authors : Louise Jones, Rafael De Andrade Moral, John C. Stephens

Abstract : Background: Minerals are an essential component of correct nutrition. Conserved hay/haylage is an important component of many horse's diets. Variations in the mineral content of conserved forage should be considered when assessing dietary intake. Objectives: This study describes the levels and differences in 15 commonly analysed minerals in conserved forage fed to horses in the United Kingdom (UK), Ireland (IRL), and France (FRA). Methods: Hay (FRA n=92, IRL n=168, UK n=152) and haylage samples (UK n=287, IRL n=49) were collected during 2017-2020. Mineral analysis was undertaken using inductively coupled plasma-mass spectrometry (ICP-MS). Statistical analysis was performed using beta regression, Gaussian, or gamma models, depending on the nature of the response variable. Results: There are significant differences in the mineral content of the UK, IRL, and FRA conserved forage samples. FRA hay samples had a significantly higher ($p < 0.05$) levels of Sulphur (0.16 ± 0.0051 %), Calcium (0.56 ± 0.0342 %), Magnesium (0.16 ± 0.0069 mg/ kg DM), Iron (194 ± 23.0 mg/kg DM), Cobalt (0.21 ± 0.0244 mg/kg DM) and Copper (4.94 ± 0.196 mg/kg DM) content compared to hay from the other two countries. UK hay samples had significantly less ($p < 0.05$) Selenium (0.07 ± 0.0084 mg/kg DM), whilst IRL hay samples were significantly ($p < 0.05$) higher in Chloride (0.9 ± 0.026 mg/kg DM) compared to hay from the other two countries. IRL haylage samples were significantly ($p < 0.05$) higher in Phosphorus (0.26 ± 0.0102 %), Sulphur (0.17 ± 0.0052 %), Chloride (1.01 ± 0.0519 %), Calcium (0.54 ± 0.0257 %), Selenium (0.17 ± 0.0322 mg/kg DM) and Molybdenum (1.47 ± 0.137 mg/kg DM) compared to haylage from the UK. Main Limitations: Forage samples were obtained from professional yards and may not be reflective of forages fed by most horse owners. Information regarding soil type, species of grass, fertiliser treatment, harvest, or storage conditions were not included in this study. Conclusions: At a DM intake of 2% body weight, conserved forage as sampled in this study will be insufficient to meet Zinc, Iodine, and Copper NRC maintenance requirements, and Se intake will also be insufficient for horses fed the UK conserved forage. Many horses receive hay/haylage as the main component of their diet; this study highlights the need to consider forage analysis when making dietary recommendations.

Keywords : conserved forage, hay, haylage, minerals

Conference Title : ICEVSHM 2021 : International Conference on Equine Veterinary Science and Horse Management

Conference Location : Paris, France

Conference Dates : December 30-31, 2021