

Exploratory Analysis of Haylage Quality Variability at Harvest

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Introduction

After corn silage, haylage is the most predominant ingredient in USA dairy diets (Kellogg et al., 2001). There are many factors during production, ensiling, and feedout that contribute to variation in haylage quality and the high inclusion rate means haylage is an important source of nutrient variability in TMR. To quantify haylage nutrient variation, we collected samples from alfalfa-grass mixtures on 7 New York dairy farms during the 2020 harvest. We used a mixed model to estimate the effect of farm, field, cut number, and weather on DM, CP, and NDF variability of haylage at harvest. The objective of our study is to identify the production factors that influence the variability in haylage quality at harvest. In the second phase of the trial, we will connect the variability at harvest to variability at feedout, in the TMR, and in milk production.

Main Findings

Haylage yield in summer 2020 was 34% lower than summer 2019 (NASS.USDA, 2019) due to low precipitation. The DM, CP, and NDF content of haylage at harvest were consistent with values reported by DairyOne (2019) across the three cuts. The mixed model analysis identified the farm (± 5.7) and fields within farm (± 4.1) as the largest random effects on DM % at harvest. The fixed effects showed DM decreased with increasing grass content (-0.14 ± 0.03), precipitation at harvest (-0.61 ± 0.24), and average solar radiation (-0.03 ± 0.01). Also, fixed effects showed DM increases with increasing average temperature at harvest (0.55 ± 0.19). Cut number was the largest source of random variation (± 1.6) on CP%, followed by fields within farm (± 1.0). CP content decreased with increasing grass content (-0.04 ± 0.00) and average solar radiation (-0.006 ± 0.002). Field was the largest random source of variation (± 1.9) on NDF content, followed closely by farm (± 1.3). The analysis of fixed effects shows significant effect of grass content (0.19 ± 0.01), dry time at the field (-1.63 ± 0.28), precipitation at harvest (-0.13 ± 0.06), and solar radiation (0.03 ± 0.00) on NDF.

Take Home Message

There is significant variation in DM, CP, and NDF content of haylage found between farms, between fields on the same farm, and between cuts. Quantifying the extent of this variation can help inform forage management and diet formulation decisions to improve nutrient delivery for precision feeding.

References

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