

Corn Silage And Haylage Variability Within Bunker Silos

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Introduction

Forages, and haylages in particular, have a large potential for variation. Variability in dry matter, fiber levels and fermentation profiles within a silo can influence herd performance and animal health. Degree of variation at a given dairy depends largely on its ability to manage cropping and harvesting systems. One advantage that bunker silos have over upright silos and bags is that ensiled feed from a given load or field is spread over a larger area of the silo. Thus, changes in forage dry matter (DM) or chemical measurements occur more gradually than in other storage systems. However, variation can still occur across the height of a silo. To estimate this potential variation, eleven corn silage and nine haylage bunker silos from nine dairies located in central New York were evaluated.

Materials and Methods

Samples were collected on six dairies with a backhoe, on two dairies with a loader bucket and on one dairy with a face shaver. Sample collection was designed to reflect the feed that would be obtained if a feeder obtained a loader bucket of feed from a region (upper, middle, or lower) of the silo as compared to a bucket obtained from the entire height of the silo face. Silos above ($n = 15$) approximately four meters in height were split into thirds for sampling, while those less ($n = 4$) than approximately four meters were split into halves. A vertical trench was dug to a depth of about 0.2 - 0.3 meters. Experimental feed obtained from each section (upper, middle, and lower) was thoroughly mixed with a silage fork and then sub-sampled to obtain a sample approximately 5-10% the size of the removed silage pile. This sample was then again thoroughly mixed with the silage fork and finally sub-sampled for analysis of dry matter (DM), ADF, NDF, crude protein (CP), lactate and VFA with wet chemical procedures (Dairy One, Ithaca,

NY). The entire approximately 31 samples were ground for analytical procedures.

Results

Within each silo, deviations from the minimum analytical result for DM, ADF, NDF, CP, and VFA were determined. Maximum deviations within a given silo were determined by dividing the range within the silo by the minimum analyzed value. For example, a silo with measurements of 44.5, 41.2 and 36.6 would have a maximum deviation between regions of 21.6% ($(44.5 - 36.6)/36.6$).

Haylage varied more than corn silage, although there were examples of extreme variation, particularly in DM, in both crops. Haylage DM deviations ranged from 5 to 45%, with a median deviation of approximately 20%. Corn silage was more consistent, with a median DM deviation of 8%. However, corn silage DM deviations still ranged from 1 to 55%. The median deviation for haylage and corn silage NDF was 14 and 8%, respectively. Variability in fermentation acids was also substantial.

Significance

Dairy feed personnel need to be aware of variability within the silo, and its effect on the final ration delivered to the cow. In some situations a feeder could be delivering an entirely different ration from one load of feed to the next, if care is not taken when obtaining forage from the silo. Techniques to minimize forage variation, such as obtaining each bucket of feed from the height of the silo face or the premixing of forages obtained from across the entire face of the silo, should be part of feeding standard operating procedures on dairies. Mechanical face shavers can vastly improve bunker face management, and reduce ration variation, by mixing forages from across the height of the silo.