

Strategies to ensure quality forage for the entire dairy herd

By Betsy Hicks and Joe Lawrence

While weather is a constant challenge to maintaining forage supply, producers can control other threats to having enough feed. Mismatched storage capacity and lack of planning or design, incorrect estimates of feed quantity, inaccurate estimates of feed quality, and spoilage are four major areas where producers risk ensuring enough forage is available to feed the herd. Both harvest quality and management of feed in the silo have profound effects on silage quality at feeding (Limin Kung, University of Delaware). By harvesting feed at the appropriate quality and managing it carefully in the bunk, the risks of running out of feed are minimized.

DETERMINE FORAGE NEEDS

Producers can employ a few strategies to mitigate the risk of running out of feed. First, planning ahead for forage needs is a step that should be taken before most others. When forage needs are calculated, it should be noted that every group of animals on the dairy has a different nutritional requirement. To optimize forages grown, feeds should match the needs of each animal group, and the total tons needed should be calculated for each. Groups to calculate needs for include lactating cows, dry cows, youngstock by stage

of growth, roughage for lactating cows, and bedding. The Dairy Herd Forage Needs Worksheet (Dairy Nutrition Fact Sheet, August 2012) can be referenced to help build forage needs for a dairy. When making calculations, guidelines for forage dry matter intake as a percent of body weight are presented in Table 1. Feeding losses should also be factored into the equation, increasing the total amount of forage needed. The number calculated, however, is only a measure of how much feed each animal group will need. It does not account for any storage losses prior to feeding, which should be evaluated by storage, and added to total forage needs.

MANAGE FORAGE STORAGE

A second strategy to mitigate risk is to evaluate the existing storage system. Of a farm's storage options, the capacity of each at different forage densities should be calculated. The system should also be evaluated for the flexibility to store forages of differing quality, what the best use of each option is, and whether storage losses the farm is currently experiencing are acceptable. When considering modifications or additions, a farm should always consider if losses can be minimized by changes in management or if

TABLE 1

Forage dry matter intake recommendations

Class of Animal	Forage DM Intake, % of BW
Lactating	1.5 – 2.0%
Dry Cows	1.2 – 1.7%
Heifers	1.0 – 2.0%

additional options are needed. If the current setup leads to inaccessible feeds and more options are needed, the farm should also evaluate options for what may work best in the short-term versus what the best long-term strategy might be. Each harvest season the farm should have a storage plan in place with planned storage mapped out. Contingency plans for a surplus of either better or poorer quality feed should be thought out ahead of time to avoid problems of burying one feed behind another. Incorporating more than one storage option into your system will ensure greater flexibility and allow feeding the right quality of feed to the right class of animal. For more information see “Strategic forage storage planning” (Lawrence & Kuck, 2018) at pro dairy.cals.cornell.edu.

Once feed is in the bunk, a farm should strive to understand the

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quantity of feed that is stored, as well as monitor and control inventory. To evaluate quantity of feed, two pieces of information are needed: volume and density (see accompanying article on page 4 for information on measuring density). Volume is traditionally measured by obtaining the length, width, and height of the forage pile. Some farms are now employing drone technology to help with inventory tracking. Drone flights can give nearly exact measurements of a bunk's volume and computerized models of the silo area are formed. These can help with inventory as well as forecasting shrink, but the return on investment is the greatest on 800-cow dairies or larger.

Miner Institute has an online calculator to help estimate forage inventory (whminer.com/mineroutreach.html) for a variety of silos. It also can be used to estimate days of silage left in inventory. Inventory control refers to how long a forage will be available at current feedout rates and allows for rate adjustments to either use up a feed faster or make a feed last longer. The University of Wisconsin Team Forage has a plethora of online tools to help establish and manage inventory (fyi.extension.wisc.edu/forage/making-a-feed-inventory/). Feed inventories should be established: 1) after harvest is completed in the fall, and projection rates are calculated to see if feed rates should be adjusted 2) mid-winter to make corrections and adjust stored forage densities to

improve accuracy of inventory and 3) after first cutting to give an early warning of inadequate supplies and a chance to make adjustment to feed rates.

EVALUATE FORAGE QUALITY

Understanding stored forage quality is key to being able to provide the right quality of feed to the correct class of animal on the dairy. If the dairy has done the due diligence of planning storage by cutting and/or quality, then this strategy is made easier. In any case, silage piles should be sampled following Hoffman, Shaver and Dyk's recommendations from the University of Wisconsin: 1) using a loader bucket or defacer, scrape across the face to create a pile on the bunker floor (safely away from the bunk face), 2) collect 5 to 8 hand grab samples, combine in a 5-gallon pail and mix, 3) take a representative sample (1 to 2 lbs) and place in a clean plastic bag. Steps 2 and 3 should be repeated for a second composite sample, and both bags should be labeled and stored in a cold place until shipping. Frequency of sampling is also outlined by Hoffman, Shaver and Dyk: with a small herd of 50 cows, frequency of sampling need only happen once a month, or when there is a suspected change in forage quality. A herd of 800 cows, however, would benefit from sampling every five days. New sample analysis should be used differently, depending on the situation of the sample. If there

is a logical reason for the change, such as a new cutting or different year feed, the new sample's data should be used. However, if there is a small change in a primary nutrient, then the change in the nutrient composition should be averaged with the old nutrient composition data, and the mean value should be used when reformulating a ration.

PREVENT SPOILAGE

Finally, spoilage prevention and minimization are keys to ensure there is enough feed for the herd. Goals of a good silage manager are a tight, straight face; no excess feed pulled down; feed cover removed daily or as needed; and seams and edges weighed down. As a result, oxygen infiltration, re-fermentation, and temperature increase are all minimized, ensuring minimal loss of dry matter. Spoilage losses are inevitable but good management ensures these losses are small. The University of Wisconsin Team Forage estimates over \$13,795 in losses per year when comparing poor management to good management per 100 cows with replacements. ■

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