Forage Inventory Evaluation & Planning

Matt Akins, University of Wisconsin

Now that harvest is over, it is a good time to get a handle on your current forage inventory to better manage it and determine how you will feed it. Inventory management is the process of measuring current forage inventory and estimating how long it will last depending on anticipated feeding rates and losses. This allows you to determine if you'll end up with excess forage (prompting you to increase feed out) or if you'll run short. If the latter is true, diet adjustments need to be made and/or additional feed (forage or byproducts) needs to be purchased.

To establish an inventory, you need to consider storage structures and forage quality. If you have a farm scale, you can easily track incoming forage to each structure and provide the best measurement of inventory available. If not, you need to determine structure volume and multiply it by estimated forage density to get a forage amount. For example, you have a bunker silo with a silage mass measuring 30' wide x 10' high x 70' long. The volume = 30' x 10' x 70' = 21,000 ft^3. Silage density is highly variable – with low densities ~12 lbs DM/ft^3, high densities ~18 lbs DM/ft^3 or possibly higher, and average densities ~14 lbs DM/ft^3. At an average density, silage dry matter in this silo would equal 294,000 lbs or 147 tons DM (21,000 ft^3 x 14 lbs DM/ft^3). Inventories contained in tower silos and/or silage bags are easier to determine, as there are charts available to estimate inventory based on the bag diameter and length remaining. Silage piles can be more difficult to estimate due to differences in width, length, height, and slopes. Unopened silo bunkers can also be difficult to estimate if they include front and back slopes. The UW-Extension Team Forage website includes resources and spreadsheet calculators which can make estimating forage inventory easier (fyi.uwex.edu/forage/harvest/#inventory). Simply enter silo dimensions and the spreadsheet will calculate forage in the structure. Quality should be included in this step to determine which forages would be best allocated to different animals (e.g., early or late lactation cows, dry cows, pre-bred/bred heifers).

Performing a forage quality analysis at each harvest can provide valuable information to help allocate forages appropriately. Taking samples from each load, combining them, and submitting the mixed sample for testing will provide a good estimate of quality in the structure. If using bags, testing samples from each field is helpful in determining exactly when the quality of feed within the bag is likely to change. The highest quality forages would be best allocated to early or high producing cows, while moderate or lower quality would be better allocated to dry cows and bred heifers. Shrink should also be factored into the equation by reducing the stored amounts 5-10%, or up to 20% for poorly managed forages.

Using the calculated forage inventories, add the amount of each forage type (i.e., corn silage, haylage/hay, straw) needed to feed the various animals on your farm to determine if your supplies are adequate. Work with your nutritionist to determine desired feeding rates for forages fed to each animal group as well as daily forage needs. Divide stored forage by the daily feeding rate to determine how many days of feed remain. For example, if you have 500 high producing lactating cows and you feed 15 lbs DM of corn silage each day, you need 7,500 lbs of corn silage DM daily (3.75 tons DM). Your inventory indicates you have 1,500 tons of high quality corn silage in storage (after decreased for 10% shrink). Therefore, there is forage for 400 days (1,500 tons ÷ 3.75 tons fed/day).

Most feed management software has the ability to track forage usage (inventory) over time as it is fed, providing estimated days of feeding for each forage and storage structure. If you are going to be short, your ration will need to be rebalanced or adjusted to compensate. Adjustments may include reducing feeding rate and including other available forages, purchasing additional forages, or purchasing high-fiber byproducts to substitute for forage.

Planning for the coming year of forage harvesting can be easier if you understand how much of each forage (type and quality) you need for different animals on your farm. If you were short of high quality haylage the previous year, then you may need to plan ahead for additional alfalfa/grass acres or use cereal grain forages to extend the growing season in the spring and/or fall. Or, if you had excess high quality haylage but not enough moderate quality haylage for your heifers, you could simply delay your haylage harvest or use other, lower quality forages to better meet heifer nutrient needs.

Prior to the harvest season, it is useful to know how much of each forage is needed and to monitor harvested amounts over time. Maintaining a forage inventory over the harvest season will allow you to determine forage quantity and quality needed as the season progresses and better plan each harvest. Evaluating forage inventory at different times offers advantages. Late-fall evaluations (October/November) allow for the purchase of feeds/forage during periods of lower prices if your inventory is inadequate. Early-spring evaluations (February/March) allow for modifications to cropping plans prior to harvest season. Mid-summer evaluations (June/July) allow for adjustments in case weather conditions don't allow proper harvest and purchase of additional standing forage is needed.