



# Timely Topics

## Corn Silage is Coming – Are you ready?

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- Inventory. With drought or flooding in much of the country, corn silage will be a major forage source.
  - Do ration projections to determine inventory needs to meet fiber requirements. High corn silage lactation diets, > 40 lb as fed, should be balanced for 22 to 24% NDF (DM basis) or greater from forage (alfalfa and corn silage).
  - Dry matter loss with fermentation and feeding should be less than 10%, but figure 15%.  
Example:  
One year supply of 34% DM silage for 1 milk cow (50 lb/day for 305 days) and 1 dry cow (35 lb/day for 60 days) with 15% loss is 20,400 lb (10 ton per cow).
- Harvest DM.
  - Target DM range for corn silage is 33 to 36%. Bunkers and piles can be closer to the 33% and stave silos can be closer to the 36% DM.
  - Avoid silage juice run-off. This is a loss of nutrients and a very potent pollutant that can kill fish in lakes and streams. Channel effluent run-off into grassy areas or lagoons.
- Chop length and particle size. Recommendations depend on processed or not.
  - Processed silage, theoretical chop length (TLC) is ½ to ¾ inches and roller spacing should be at about the thickness of a dime (<.1 inches). The goal in chopping silage, whether processed or not, is to minimize or eliminate whole kernels and cross cut sections of cob (commonly referred to a cob disks or hockey pucks).
  - Unprocessed silage, TLC is 3/8 inches for wet silages (30 to 35% DM) and a ¼ inch for silages > 35% DM is recommended.
- Corn silage particle length. Measure during harvest using Penn State shaker box.
  - Processed silages, 5 to 10% on the top screen and 60 to 70% in the middle screen packs and feeds well. Some people recommend 10 to 20% on the top screen and 50 to 70% in the middle screen, but we find more large cob and stalk pieces that cows sort and refuse with this much on the top screen. The middle screen particles are excellent effective fiber that cows will consume and not sort.
  - Unprocessed silage, the top screen should be less than 5% as anything above this is usually cob discs and other plant parts the cows will not consume. The goal is to maximize middle screen material.
- To process or not process BMR? (May be beneficial, but then again may not).
  - A recent study from the University of Wisconsin showed no benefit in milk production or DM intake to processing BMR silage when fed at 40% of the diet DM.
  - At the 2002 Dairy Science meetings, the University of Delaware reported processing BMR increased NDF digestibility 3% units, reduced whole kernels from 39 to 7% of the DM, and increased milk production 8.8lb/day over unprocessed BMR. The BMR was chopped at ¾ inch TLC and rollers were set at a clearance of .1 inch.



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- How high to chop silage? (2 studies on chop height at the 2002 Dairy Science meeting)
  - University of Delaware research showed chopping at height of 18 compared to 5 inches decreased DM yield by 10%, but increased DM content of the silage 2% (38.6 vs 36.6%), NDF digestibility 2.4% (50.7 vs 48.3%) and starch content 2% (34.3 vs 32.4%). Lignin was reduced from 3.3% at 5-inch height to 2.4% at 18-inch height.
  - In feeding studies with 28 verses 9-inch chop height corn silage, the Dairy Forage Center in Wisconsin found no difference in milk production or DM intake.
  - For drought stressed corn silage, a high chop has the advantage of lowering nitrate levels in the silage. The highest levels of nitrate are found in the bottom portion of the stalk. However, yields are reduced when forage quantity is probably already in short supply.
  
- Silo Filling and Management.
  - Fill silos as rapidly as possible.
  - Silage cannot be over packed. The following formula from Wisconsin provides a guideline as to how much silage can be effectively packed per hour. Divide the pack tractor(s) weight by 800 to get tons of silage that can be packed per hour.
 

Example:  
40,000 lb tractor can pack about 50 tons per hour (40,000 lb/800 = 50 tons/hour). This equates to seven wagonloads (7 to 8 tons/wagon) in a one-hour period for adequate packing to be achieved.
  - The goal is to achieve a silage density of greater then 16 lb of DM per cubic foot.
  - Use a quality silage inoculant to improve fermentation rates and reduce dry matter losses
  
- Cover bunkers or piles to reduce spoilage.
  - Kansas research indicates 60% loss in DM from the top 3 feet of uncovered silage.
  - Feeding spoiled silage from the top 3 feet, even at only 5% of the total ration DM, reduced DM intake and nutrient digestibility.
  - The best covering is plastic (6 mil thickness) with 20 to 25 tires per 100 square feet.
  
- Fermentation Profiles.
  - Dairyland, Cumberland Valley and Dairy One are labs offering fermentation analysis.
  - Fermentation analysis should be considered in trouble shooting and once or twice per year to assess silage management on farms.
  - Limin Kung from Delaware discussed silage analysis at the 2002 Dairy Science meeting and suggested the following fermentation profile for 35% DM corn silage:
 

|                      |                 |
|----------------------|-----------------|
| pH                   | 3.8 to 4.2      |
| Lactic acid          | 4% of the DM    |
| Acetic acid          | 1.5% of the Dm  |
| Lactic: Acetic ratio | 3:1             |
| Ethanol              | <1.5% of the DM |

Drier silages will be lower in lactic and acetic acids and higher in pH. Wet silages will be lower in pH and lactic acid, but could be higher in acetic acid.