

Using Your Feed Resources, Labor, and Dollars Wisely



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Well-managed and properly implemented feeding programs are one of the cornerstones associated with profitable dairy operations. Nutrition and associated management programs must support the nutritional needs of lactating dairy cows, dry cows, and replacement heifers. With feed costs representing approximately half of the cost for producing milk, profitability is directly impacted by minimizing losses of forages and grains on farm, using available feed, labor, facility and economic resources wisely, and managing feed costs while optimizing milk production. Although some costs associated with feeding programs are outside a farmer's control, many are not. In a companion article entitled "Targeting Dairy Feeding Programs for Less Feed Waste or Shrink", ways to evaluate and minimize feed shrink on-farm were discussed. This article, the second part of the series, looks at feeding management practices that can help improve the use of feed, labor, facility, and economic resources. Specifically, it addresses:

- Feed Bunk Management,
- Managing Silo Structures to Minimize Losses, and
- Other Aspects of Dairy Cow Management that Impact Use of Feed Resources.

Feed Bunk Management

Management of the feed in the feedbunk and the labor responsible for feeding cattle is critical to optimize milk production, rebreed cows in a timely manner, minimize cow-health issues, and optimize a dairy farm's profit. The goal is to provide each group of cows with the nutrients needed to support their milk production, maintenance, growth, health, and reproduction. When balancing diets for groups of cows, we are concerned about providing the nutrients in the total dry matter intake that the cows will consume. When cows do not eat the amount of feed expected, they do not receive the intended amount of each nutrient. Consequently, milk production, reproduction, or health suffers which impact profitability of the dairy operation. Personnel feeding the cows need to understand that the amounts fed and following key feeding principles are very important. Managers, on the other hand, need to spend time

training and reviewing concepts with the labor responsible for feeding not only the lactating herd, but dry cows and replacement heifers also.

Practices to review for the lactating herd include, but are not limited to:

- Lactating cows should have access to the feed bunk at least 20 hours daily, but preferably 22 hours daily (i.e., in holding pen for no more than a total of 2 to 3 hours daily). Minimizing the time away from feed allows cows to eat multiple meals, thus spreading the daily dry matter intake over the day and avoiding larger bouts of intake which can help optimize feed intake. This is especially important for fresh, early-lactation, and high-producing dairy cows.
- Cows should be fed at a consistent time each day. Feed being delivered needs to be consistent throughout the length of the feedbunk, thus TMR management is critical. (For more information, see companion article entitled "[Targeting Dairy Feeding Programs for Less Feed Waste or Shrink](#)").
- Feed should be provided throughout the length of the entire feed bunk at each feeding for the lactating herd. Fresh feed should be provided at least twice daily. Feeding at times different than when cows return from the milking parlor may help prevent large bouts of feed being consumed.
- Feed should be pushed up multiple times daily, but especially within 30 minutes of feeding. Cows will consume feed after returning from milking, at feeding, and when feed is pushed up toward cows. The act of feeding cows has been shown to stimulate the greatest number of cows eating at once and may help equalize meal size. Thus, pushing feed up shortly after feeding is important to have feed within easy access.
- Feed should not heat in the feed bunk or in the TMR mixer prior to feeding.
- Uneaten feed should be routinely removed (usually daily) from the feed bunk. Milking cows should be fed for a minimum of 1 to 2% of their daily intake left after a 24-hr feeding period. Fresh cows should be fed for 5% of daily feed intake left in the feedbunk. If a farmer is feeding for a slick bunk at the time of feeding, the bunks have to be monitored throughout the day and feeding time adjusted rather than feeding at the same time every day.
- Waterers should be cleaned out multiple times weekly and scrubbed once weekly with a brush and a weak chlorinated solution (1 cup (0.25 liters) of household bleach to 5 gallons (20 liters) of water). Rinse the chlorinated solution out after cleaning. Water intake governs feed intake, not to mention that milk is 87% water.
- Adequate feedbunk and freestall (or resting) space should be provided, such that groups are not overcrowded. Ideally, 24 inches (61 cm) of bunk space should be provided to the milking herd (six-row barns may provide 18 inches (46 cm) per cow, less than ideal). For fresh and close-up dry cow groups, the recommendation is 36 inches (91 cm) per cow

and one freestall or a minimum of 100 square feet per cow. Crossovers should be placed every 60 to 80 ft (18 to 24 m) in pens to allow easy access to the feedbunk. Post and rail feed barriers should be at a height of 48 inches (122 cm) from the cow-standing surface and located 8 to 12 inches (20 to 31 cm) forward of the bottom barrier to allow cows to reach and consume feed. Head locks should be angled such that the top is 4 to 6 inches (10 to 15 cm) forward of the bottom of the attached headlock (Dan McFarland, 2015 DAIReXNET webinar "[Troubleshooting Design-Based Cow Comfort](#)").

- High-producing cows should be in an environment with a temperature-humidity index below 68. Fans and sprinklers should be used over the feedbunk and should be placed on sensors to turn on fans and adjust the time cycles of sprinklers. Fans should be turned on when temperatures are above 65° to 70°F (18 to 21 °C) depending on humidity and deliver 800 to 900 cfm per headlock or feeding space. Sprinklers along the feedbunk should be used in conjunction with fans and should start at 68 °F (20°C) with water nozzles delivering 0.5 to 1.0 gallons (1.9 to 3.8 l) of water per minute for 1 to 2 minutes within the 15 minute total cycle. Fans should run continuously. As the temperature increases, the cycle interval for the sprinklers decreases. For example, at 82 °F (28°C), sprinklers run for 1 to 2 min with a cycle time of 6 to 7 minutes. In addition, fans should be used over the freestalls or resting area and fans and sprinklers should be used in the holding pen. Recently, the use of multiple, properly spaced holes in positive ventilated tubes have been used to direct air movement downward toward the cows in holding pens. For more information on fan and water nozzle sizes and placement, see Elanco's Heat Abatement Guide: Mechanics of Heat Abatement at <https://www.elanco.us/pdfs/heatabatementguide.pdf>.
- First-calf heifers should be housed separately from the mature cows. Studies have shown feeding times increased by 11% and milk production increased by 9% when housed separately from mature cows. Separation of first-calf heifers is even more critical when freestalls are overcrowded and/or feedbunk space is limited, i.e. with 6 row barns.
- Dairy cows should be consuming a similar amount of feed as suggested in rations balanced by the nutritionist. If not, discuss this observation with your nutritionist, who may wish to make adjustments in the diet. Daily or weekly refusals will need to be weighed to assess the consumption by each group of cows.

Manage Silo Structures to Minimize Losses

Management of a bunker silos, drive-over silage piles, silage bags and upright silos during harvest, storage, and feedout directly impact the quantity and quality of silage fed to dairy cows. Mismanagement of any of these silage storage structures can represent the greatest amount of feed lost on today's dairy operations and the greatest opportunity for changes to positively impact profitability!!! For example, dry matter losses can be substantial in bunkers and drive-over piles

not harvested at the correct moisture, packed adequately, and covered with plastic that is weighed down adequately, i.e with tires which touch. A study with uncovered bunker silos showed a 75% loss of dry matter of corn silage within the top 10 inches (25 cm) and 25% losses within the next 10 inches of surface area on top of the bunker compared to bunkers properly covered with plastic and tires. For a 30 ft (9 m) by 100 ft (30 m) bunker, approximately 50 tons (45 metric tons) of silage would be lost. This amount of silage is equal to the amount needed to feed approximately 10 lactating cows for a year or \$2250 worth of silage (valued at \$45/ton silage). These losses are substantial and are not seen unless the difference between the amount of silage entering and fed out of a structure is measured. To make the best use of forage resources, proper management of forages during storage and at feedout is critical. The following key areas should be considered when using a particular storage structure.

Silage bags:

- Bags should be placed on a solid surface with adequate drainage. This surface area should be readily accessible to feeding equipment used for loading other forages and commodity storage areas. Soil surfaces can become muddy during wet times of the year, especially with inadequate drainage. If not managed extremely carefully, gravel bases with large particle size material can allow for addition of large stones to mixing equipment, potentially causing equipment failure. Storage pads should be located away from woods and fence lines with trees, such that a 3 ft non-vegetative perimeter exists.
- Minimize access by raccoons and other wildlife to this storage area. They can make holes in the plastic and surrounding silage, greatly increasing spoilage. Temporary electric fencing with the fence charger activated from dusk to dawn can be used to deter raccoons. Two strands of electric wire is preferred at 6 and 12 inches from the ground, but one strand can also be used if placed 6 to 8 inches off the ground. Electric fences should be used with care and appropriate caution signs installed to alert workers of the hazard.
- Silage bags need to be checked daily for holes caused by rodents, varmints (raccoons), and/or birds. Holes in the plastic should be repaired quickly with tape to prevent spoilage.
- Plastic should be removed as needed, but not before the time of feed removal. Rate of feed out should be at least 1 foot per day to prevent yeast and mold growth, silage from heating, and reductions in feed intake. Once silage has been removed, the plastic at the open silage face should be closed and weighted to prevent winds from opening the plastic and increasing silage spoilage and losses.
- A Koster™ tester, microwave oven, or a drying oven should be used routinely to measure the dry matter of the silage and adjust the ration accordingly. Since bags are filled from forage obtained at a location within a field (and not layered with forage obtained across field(s)); dry matter content may be more variable than bunkers or piles.

- When filling bags, ensure that the silage bagger is set correctly for the silage moisture content and crop. Packing density is important to limit feed spoilage and waste.

Upright silos:

- When filling, use the distributor to make sure the silo is filled evenly across the width of the silo.
- At the conclusion of filling, make sure the top surface is level. Cover with plastic, with weighting down of the edges. Be careful to ventilate the silo to displace silo gasses before entering.
- Seal the entrance of the chute (covered area with doors) so that varmints (i.e. raccoons) cannot enter the silo. Raccoons and other mammals can dig holes in the silage, resulting in excessive spoilage.
- Adequate amounts of silage must be removed daily to keep the silage fresh. Larger amounts will need to be removed during the warmer parts of the year compared to cool months. Generally, this is at least 4 to 8 inches per day, depending on the ambient temperature.
- If spoilage is noticed around the walls, air is seeping into the silo and the walls may need to be resealed.

Bunkers and drive-over piles: The management of bunkers and drive-over piles has been covered in a companion article on DAIReXNET. Some key points which impact feed shrink include:

- Bunkers should be sized such that a minimum of 8 to 12 inches is removed daily.
- Silage piles should be packed using tractors to achieve a bulk density greater than 44 lb as fed/ft³. To achieve these packing densities, silage should be spread in thin layers on a wedge and packed continuously and multiple times with the adequate amount of tractor weight. Recommendations are to use 800 lb (364 kg) of packing tractor weight per ton of silage delivered per hour of harvest.
- Height of silage at the walls of a bunker should not exceed the height of the side walls. Heights greater than the side walls present safety issues for tractor operators, often resulting in poorly packed silage with the spoiled silage discarded at feedout.
- Bunkers should be filled quickly and then covered with plastic or a barrier film plus plastic and then the cover needs to be weighted down. If tires are used, they should touch to exclude oxygen and weigh down the plastic. Plastic should be placed on the side walls to prevent oxygen from entering the stored silage.
- For additional considerations, please refer to the article entitled "[Bunker Silo and Drive-Over, Silage-Pile Management](#)".

Other Aspects of Dairy Cow Management Impact Use of Feed Resources

Reproductive efficiency, cow comfort, and replacement management practices impact the efficiency of which feed resources are used on a dairy operation.

Reproductive efficiency: Dairy cows with long days in milk or long dry periods are not as efficient at using feed resources. If diets are not properly formulated, these cows deposit a higher proportion within body fat stores and not for milk production compared to early lactation cows.

Cow comfort: Dairy cows need a comfortable place to rest for approximately 12 hours daily. During this time period, dairy cows ruminate (chew their cuds) which, in turn, buffers the rumen contents and decreases the particle size of forages to increase feed digestion. Minimizing the effects of heat stress through the use of the appropriate number, size, and location of fans in the resting area and holding pen is an important part of cow comfort and getting cows to milk to their genetic potential and rebreed in a timely manner.

Heifer rearing programs: Replacements represent the future productive units of the dairy operation. As such, they need to be fed and managed so they grow and calve at the proper size at an age of 22 to 24 months. In addition, the number of heifers raised needs to match the number needed to replace culled cows and adjust for growth in herd size, if desired. Excess heifers could be sold at an early age, thus freeing up forage, facility, labor, and economic resources. Delaying age at calving increases rearing and associated feed costs and increases the amount of forage needed. In the US, delayed age at calving is generally associated with an additional \$2 to \$3 daily feed costs for those heifers calving after 24 months of age. Not to mention, they are consuming 20 to 23 lb/day of dry forage (depending on breed and amount of grain fed), thus increasing the forage needs of the dairy operation and manure that must be handled. Heifers consume a tremendous amount of feed (5.5 to 6 tons of dry forage) over a 2-year growth period per heifer. Consequently, the number of heifers being raised needs to be reviewed so feed resources are wisely allocated.

Bottom Line

Management practices for feeds during harvest, storage, and at feed out impact feed shrink and thus total feed cost and profitability on dairy farms. With attention to details associated with each of these practices, income over feed cost can be optimized. Efficient use of labor, facilities, and feed sources must be considered when designing, implementing, and evaluating feeding management practices. When evaluating feeding management practices, replacement heifer programs must be considered.