Alternative Forage Options for Dairy Heifers

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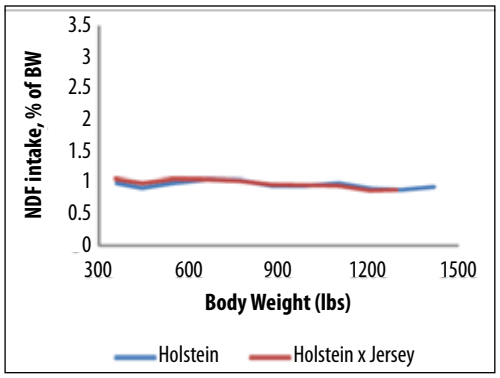
High quality corn silage and alfalfa are often used for feeding dairy heifers. These can work well for young heifers up to ~8-12 months of age depending on forage quality. However, pregnant dairy heifers have lower energy needs than younger dairy heifers and feeding the correct diet energy is important to control weight gain. Pregnant heifers require ~58-62% total digestible nutrients (TDN) depending on environment while corn silage and alfalfa silage are usually well above this level. In research studies in which corn silage/alfalfa silage diets (65% TDN) are fed to pregnant heifers, gains can be 2.5 lbs/day or greater. Recommended gains are 1.8-2.2 lbs/day with higher gains leading to greater internal fat deposits and potentially more difficult calving and transition to lactation. Delaying harvest for more mature alfalfa or grasses reduces energy; however, the main goal of dairy forage production is usually to produce high quality forages. Use of higher fiber forages such as warm season perennials, straw, corn stover, sorghums, or cereal grain forages at heading can be used to dilute diet energy and restrict intakes when combined with corn silage and alfalfa silage. Higher fiber diets not only lower energy content but also reduce intakes since dairy heifers eat ~1% of body weight (BW) as neutral detergent fiber (NDF) each day (Figure 1). For example, a 1,000 lb heifer will eat ~10 lbs NDF. If the diet contains 45% NDF, the heifer will eat 22 lbs dry matter (DM). However, at 50% NDF the heifer will eat ~20 lbs DM.

Figure 1. Daily NDF intake as % of BW maintains a nearly constant 1% of BW (data from over 9,000 pen intakes at MARS).



Recent work at the Marshfield Agricultural Research Station (MARS) looked at growth and management of the warm-season perennial grass, eastern gamagrass. Based on multiple years of data, the greatest forage yield was from a single harvest in mid-September with the forage quality being ideal for partially replacing corn silage to reduce diet energy. Dry matter content at cutting is 30-40% so minimal to no wilting time is needed prior to harvest. Typical yields are 3-4 tons DM/ac when harvested in early fall. NDF content is ~75% and crude protein 5-7% DM when harvested in September. In a heifer feeding study, use of eastern gamagrass at 20-30% of the diet helped control gains within recommended guidelines. One unique feature of gamagrass is that heifers readily consume the silage with minimal or no sorting that can occur when using straw to dilute diet energy.

Commonly used roughages to lower energy in heifer diets include straw and corn stover. Typical inclusion rate is 10-20% of diet DM to obtain desired diet energy content. Sampling of the roughage is needed as variation exists in fiber content and digestibility and mineral content. These have been used successfully in recent studies to control intakes and gains; however, heifers can sort these roughages, with corn stover being more sortable than straw. Sorting can be reduced by pre-chopping to 2-3" length and/or adding water for a target diet DM of 45-50%. It is advisable to feed for minimal refusals (bunk score of 1 out of 3; few feed particles in bunk) to ensure heifers eat the entire diet and not sort only for the higher quality forages.

Cereal grain forages (e.g., wheat, rye, triticale, barley) are an option more farmers have potential to use with increased growing of cover crops. Harvesting at boot stage will produce higher quality forage. Harvesting at heading stage will be more ideal for pregnant heifers. When harvested at boot to heading, protein and energy can be close to ideal to feed the forage alone or with minimal other ingredients. Yields have been 1-2 tons DM/ac at these stages (harvested mid- to late-May) with potential for double cropping.

Sorghums (forage sorghum and sorghum-sudangrass) are lower energy options to replace corn silage with similar production. Conventional (non-BMR) and photoperiod sensitive sorghums have an ideal fiber and energy content to blend with a moderate or high quality haylage or a protein byproduct (e.g., distillers grain, gluten feed) in

Photo 1. Eastern gamagrass planted at 40" rows showing crown size and potential to straddle rows with harvesting equipment.

Photo 2. Sorghum-sudangrass planted July 4 and harvested September 22, 2017, with yield of 2.3 tons DM/ac.

pregnant dairy heifer diets. Harvesting strategy affects yield with a single harvest having 1.5-2 times greater yield than a 2-cut system. At MARS, two-year yields of conventional forage sorghum and sorghum-sudangrass planted in early June in 15" rows and harvested one time in October or early November yielded 6-8 tons DM/ac. The NDF content was 55-60%, and protein was 5-7%. Expected inclusion rates could be up to 50-75% of the diet depending on the quality of other forage ingredients. Moisture content can be a problem using a single fall harvest when planted late; cutting and wilting may be needed earlier in fall. This situation occurred in a recent trial with sorghum-sudangrass in a 12-acre production field at MARS (planted July 4, 2017) yielding 2.3 tons DM/ac when harvested in mid-September.

Farmers have several forage options to blend with corn silage and haylage. The choice will depend on cropping and rotation systems for each operation as well as cost of production. Before trying a new forage it is suggested to discuss options with your agronomist and nutritionist about best management practices and how it will affect forage inventory and diet formulation.