Heifers are the future of the dairy herd and it’s important to consider management practices to raise the best quality replacements. Economic factors must also be considered as raising replacement heifers is one of the biggest expenses on a dairy farm. Grazing as a management practice is not new. However, even as farms increase in size, grazing heifers is still a viable option for any dairy farm. Grazing dairy heifers can be practiced at any scale and offers important benefits to animal health and production, reduced environmental impact, and decreased labor expenses.

**What is the Dairy Heifer Grazing Initiative?**

In 2015, a collaboration between Dane County UW-Extension, Dairy Grazing Apprenticeship, and UW-Madison Center for Integrated Agricultural Systems, created the Dairy Heifer Grazing Initiative. This project was established to increase the number of dairy heifers grazed on permanent pasture in Dane County. Grants from Yahara WINs and SARE provided the funding to offer cost-sharing to dairy farmers interested in grazing dairy heifers. Three Dane County dairy farms participated in the initiative. One farm is a 250-cow conventional dairy in the northwestern area of the county. The other two farms are located within the Yahara River Watershed in the southern part of the county. One is a 60-cow grass-based dairy transitioning to organic. The third farm raises replacement heifers on grass.

Research was conducted during the grazing season of 2016 on the three Dane County farms. As a result of collaboration with NRCS, research was also conducted on a Brown County CAFO. Across all the farms, data was collected on a total of 44 heifers ranging in age from yearlings to twenty-one months. Over 147 acres of pasture were involved in this project.

**What do farmers think about grazing dairy heifers?**

Overall, farmers have a positive view of grazing dairy heifers. Besides positive anecdotal evidence from farmers and custom raisers who already raise dairy replacements on managed pasture, Wisconsin dairy farmers generally see benefits to raising heifers on pasture. Pat Hoffman, at the Marshfield UW Agricultural Research Station, surveyed dairy farmers on their views of grazing heifers. Nearly 75 percent of confinement dairy farmers held very or somewhat positive views about raising heifers on pasture. Also 72 percent of traditional dairy farmers were very or somewhat positive about managed pasture.

Ninety-eight farmers in Dane County with dairy heifers were surveyed about their perceptions of grazing heifers. Ten completed surveys were returned (n=10). Participants were asked how they perceived the impact of grazing on areas of the farm business and production system. Using a Likert Scale of 1 (very negative) to 5 (very positive), survey respondents indicated that they felt grazing had a very positive impact on time and labor requirements of the farm (average of 5). Other areas, heifer health, milk production, environmental, and economics, were rated positively by farmers (average of 4).
While considered a positive management practice, few farmers consider raising their dairy replacements on grass. When asked whether they have ever considered grazing their dairy heifers, only four indicated they had. Survey respondents indicated they were raising an average of 175 heifers per farm. While many farmers have some pasture or turn-out lots, few practice managed grazing on this acreage.

Survey respondents were asked what concerns they had about grazing heifers on their own farm, or what challenges they had heard from other farmers (see figure to the right). The majority of farmers indicated that not having enough land was their primary concern when considering changing the way they manage their dairy replacements (6 responses). Taking land out of commodity crop production was another concern voiced by farmers (5 responses). Four survey respondents reported that they perceived an increase in the time and labor requirements of grazing dairy heifers. This could be a result of some wide-spread perceptions that farmers who graze often have cattle get out of temporary fence. Some indicated as much in written comments that they, “did not want to spend time [sic] chasing heifers all over the place when they get out”. Other concerns indicated by farmers were: extra costs and expenses (3 responses) and changing management style (1 response).

**Farm Economics Cost Benefits**

Labor needs related to heifer management are reduced when grazing replacements. Farmers were asked to report on the average amount of time they spend managing heifers before and after the research project. Across all areas, farmers reported spending 77.5 minutes per day managing heifers before the project. After managing heifers on grass, farmers reported spending only 17.25 minutes per day. This time includes feeding, breeding, animal health, pasture maintenance, and moving animals. Farmers indicated that the majority of their time is spent moving fences and animals. These tasks accounted for 74% of the total time reported by farmers.

On average, farmers reported a reduction of one hour a day spent on heifer management after switching to grazing. Assuming an average wage of $15 per hour, this results in a total labor cost savings of $3,150 for the entire grazing season (April through the end of October).

Raising replacement heifers is one of the biggest expenses on a dairy farm. For two years heifers need feed, bedding, housing, and veterinary care, all without any direct return on investment. It’s not until heifers start milking do they begin to pay their way on the farm. Grazing heifers up until freshening can reduce some of the costs related to raising replacements.

Implementing managed grazing of heifers on the farm means some upfront expense to take land out of grain production and establish permanent pasture. Other initial expenses include fencing, installing a water system, and
growth rates. At the start of the project, yearling heifers weighed 638.95 pounds and bred heifers weighed 1266.73 pounds, on average. After grazing, yearling heifers and bred heifers had a rate of gain of 0.7 pounds and 0.6 pounds per day, respectively.

Another benefit to raising heifers on grass, especially bred heifers, is an improvement in body condition compared to their confined counterparts. Before grazing, yearling heifers averaged a body condition score of 3.23. Bred heifers, before grazing, averaged a body condition score of 3.48. Yearling heifers had a 0.1 reduction in their body condition score after 145 day of grazing. Bred heifers saw a slightly larger reduction of 0.2 in their body condition score after only 134 days of grazing. During this time grazing accounted for 100% of the yearling’s feed intake and 95% of the bred heifers’ intake.

Reduced Environmental Impact

Cattle lots, barnyards, and acreage in corn for grain and silage contribute to phosphorus loss and affect surface water. Cattle lots and barnyards alone account for seven to 37 percent of the total farm phosphorus loss since these areas can have high manure and animal densities, according to research done by the US Dairy Forage Research Center. By grazing dairy replacements instead of raising them in confinement, this change in heifer management not only prevents soil erosion and sediment loss by establishing a cover on crop acreage, it also decreases manure concentration in areas at risk for runoff, such as barnyards and lots.

Grazing dairy heifers also takes vulnerable land out of grain production and instead establishes a permanent cover. Due to the increased risk of soil erosion and sediment loss by establishing a cover on crop acreage, it also decreases manure concentration in areas at risk for runoff, such as barnyards and lots.

Improved Animal Production

Research from the University of Wisconsin and University of Minnesota on dairy heifers has shown that young animals on pasture can perform better than animals raised in confinement. The growth, development, and future productivity of dairy heifers are positively impacted by being raised on pasture. In the on-going Wisconsin Integrated Cropping Systems Trial (WICST), heifers on managed pastures match the weights and age at first calving of their confined counterparts. Heifers on managed pastures also outperformed the confinement heifer in terms of average dairy gain (ADG) during the pasture season and milk production in their first lactation. The pastured heifers had an average gain of 1.97 pounds per head per day, which is significantly higher than the 1.86 pound per head per day for the confined heifers. The exceptional performance of heifers raised on pasture continued through to their first lactations. Pastured heifers in the WICST study produced about 2,000 more pounds of milk in their 305-day adjusted lactation than the heifers that had been raised in confinement.

Heifers on farms participating in the Dairy Heifer Grazing Initiative also showed similar growth rates. At the start of the project, yearling heifers weighed 638.95 pounds and bred heifers weighed 1266.73 pounds, on average. After grazing, yearling heifers and bred heifers had a rate of gain of 0.7 pounds and 0.6 pounds per day, respectively.

Another benefit to raising heifers on grass, especially bred heifers, is an improvement in body condition compared to their confined counterparts. Before grazing, yearling heifers averaged a body condition score of 3.23. Bred heifers, before grazing, averaged a body condition score of 3.48. Yearling heifers had a 0.1 reduction in their body condition score after 145 day of grazing. Bred heifers saw a slightly larger reduction of 0.2 in their body condition score after only 134 days of grazing. During this time grazing accounted for 100% of the yearling’s feed intake and 95% of the bred heifers’ intake.

Reduced Environmental Impact

Cattle lots, barnyards, and acreage in corn for grain and silage contribute to phosphorus loss and affect surface water. Cattle lots and barnyards alone account for seven to 37 percent of the total farm phosphorus loss since these areas can have high manure and animal densities, according to research done by the US Dairy Forage Research Center. By grazing dairy replacements instead of raising them in confinement, this change in heifer management not only prevents soil erosion and sediment loss by establishing a cover on crop acreage, it also decreases manure concentration in areas at risk for runoff, such as barnyards and lots.

Grazing dairy heifers also takes vulnerable land out of grain production and instead establishes a permanent cover. Due to the increased risk of soil erosion and sediment loss, corn fields are also potential sources for phosphorus loss during the winter and spring months when the main crop is not growing. This could result in significant watershed impact since for every ton of soil lost, four pounds of phosphorus leave the system. Research has shown that phosphorous loss on grazing land was low, only 1.2 to 2.4 pounds per acre.

Feed Quality & Production Benefits

Forage analysis was conducted on pasture clippings each month of the grazing season, May through October. Clippings were taken on paddocks heifers would be entering in the next rotation cycle. All paddocks included in this analysis were a mix of legumes and grass (primarily 60% legume, 40% grass).
Conclusions

Numerous research studies, including the Dairy Heifer Grazing Initiative, show there are social, economic, and environmental benefits to grazing dairy heifers. As profitability margins decrease and get tighter, dairy farmers are looking for ways to cut costs without damaging animal health and production. Grazing dairy heifers instead of raising them in confinement systems can be one such management practice to improve your bottom line.

Getting started with grazing heifers on your farm can be overwhelming. Besides deciding what forage species to include in pastures, determining rotation length, grazing height, and what fencing materials are all important questions to think through before you start. Refer to UW-Extension’s publication, Pastures for profit: A guide to rotational grazing (A3529), available on the Learning Store website (https://learningstore.uwex.edu/), for help with answering these questions to fit your particular situation. Your local Extension Agriculture Educator can also give you recommendations specific to your area.

The figure above shows the test results of the forage analysis across all paddocks on all farms in the study. Results are organized by month to show the variability of forage quality during the grazing season. Dry matter values increase during the peak of the grazing season, and then decrease as the season progresses. Crude protein levels stay consist throughout the season, leveling off after July. The moisture content of the pastures reflects the variability of moisture availability through the summer months. Pastures have less moisture during the dry months of the summer (July and August) and more moisture during the early summer and early fall months.

Relative Feed Quality (RFQ) values were also collected on these clippings. The table to the right shows how these values changed during the season. Forage quality is at the highest at the start of the season, with the spring flush, and at the end of the season, as temperatures cool.

<table>
<thead>
<tr>
<th>TABLE. RFQ VALUES PER MONTH OF THE SEASON</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAY</td>
</tr>
<tr>
<td>JUNE</td>
</tr>
<tr>
<td>JULY</td>
</tr>
<tr>
<td>AUGUST</td>
</tr>
<tr>
<td>SEPTEMBER</td>
</tr>
<tr>
<td>OCTOBER</td>
</tr>
</tbody>
</table>