A Summary of Dairy Grazing Practices in Wisconsin

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Introduction

Managed grazing is an effective option for dairy farmers in Wisconsin. This system, which maximizes utilization of fresh pasture and focuses on reducing production costs, has potential to improve profitability of dairy operations of all sizes. Managed grazing is size-neutral and flexible, a practice that can be adapted to any farming system. Dairies using managed grazing average 61 milking cows but range from over 1000 milking cows to under ten.

Table 1. Managed grazing at a glance

Number of dairies using MiG	3070
% of all dairy farms	22%
Average herd size	61
Average years using MiG	19
Rolling herd average	15,430 lb
Pasture % of ration	
Herds <50 cows	66%
Herds >50 cows	49%
% of farms using cross-breeding	27%
Average culling age	6.4 years
Acres of pasture	93 acres
Length of grazing season	7 months

Managed grazing involves dividing up large pasture areas into small paddocks of a few acres and rotating the herd from one paddock to the next. Pasture productivity is often two or three times higher as a result of the rest period provided between grazing events in each paddock (Undersander et al. 2002). Under rotational management, pasture nutritional quality is as good as or better than prime hay. The substitution of pasture harvested by the cow for mechanically harvested feeds can reduce production costs significantly (Kriegl and McNair 2005).

This report summarizes recent surveys of dairy producers using managed grazing. Two sources were used for the study. The first is the 2007 Census of Agriculture. In Section 32 of that survey, question 1-G asks if the producer practices 'rotational or management intensive grazing'. Using that question, we sorted the rest of the data based on whether respondents checked that box or not. The second data source was an original survey we designed and sent out in partnership with the Wisconsin Agricultural Statistics Service in early winter, 2010. We generated a mailing list from dairy farmers who checked the rotational grazing box in the 2007 Ag Census and then randomly selected names from that list. We sent out 1568 surveys and received 771 back (a 49% return rate).

Characteristics of grazing dairy farms in Wisconsin

Data from the 2007 Census of Agriculture

Table 2. Dairy grazing by region

Region of WI	Number of dairy farms	Number of MiG dairies	Percent MiG
Central region	1091	169	16%
East central	2166	234	11%
North central	2241	517	23%
North east	719	97	15%
North west	1502	329	22%
South central	1666	243	15%
Southeast	465	54	12%
Southwest	2240	632	28%
West central	2066	477	23%

According to the Census of Agriculture, an estimated 3070 Wisconsin dairy farms (22% of all dairy farms) used management intensive grazing (MiG) in 2007. Table 2 shows the regional distribution of dairy grazing farms. On average, MiG dairies had significantly smaller milking herds and more crop and pasture acres per cow than non-MiG dairies. Milking herds averaged 61 cows with another 64 head of young stock for MiG farms, with the herd size on non-MiG farms averaging 109 milking cows and 93 head of young stock. Farmers using MiG

reported owning fewer acres than non-MiG farmers (249 vs. 292) and they reported lower land values ($2850 per acre vs. $3355 per acre); whether this reflects the use of less productive land for grazing systems or other factors, such as regional variation or farm infrastructure is unknown. Sixty-six percent of MiG farms reported renting additional land (an average of 153 acres) while 71% of non-MiG farms reported renting additional land (an average of 233 acres). Total acres farmed per head of cattle averaged 3.2 for MiG farms and 2.6 for non-MiG farms.

MiG farms in the Census averaged 93 acres of pasture or 1.5 acres per lactating cow. Categories of pasture include cropland pasture, which is land that could be planted to annual crops but is used only for pasturing livestock, permanent pasture or pasture that is not tillable (never used for annual crops), and woodland pasture. Forty-one percent of respondents reported an average of 47 cropland pasture acres and 73% of respondents reported an average of 52 acres of permanent pasture. In contrast, among non-MiG farms, only 28% reported cropland pasture acreage (30 acres), and 56% reported permanent pasture acreage (41 acres). Woodland pasture acreage was reported by 41% and 22% of MiG and non-MiG farmers, respectively. Woodland pasture acreage was similar between categories at 47 and 51 acres for MiG and non-MiG farmers, respectively.

Acres of hay grown on MiG farms averaged 65 with 56% of farms reporting making haylage on an average of 84 acres. About two thirds of MiG farmers (66%) reported raising an average of 75 acres of corn for grain and 70% reported growing an average of 36 acres of corn silage.

MiG farms were more likely to fertilize pastures than non-MiG farms (27% vs. 9%) and they fertilized more acres (52 vs. 33). Fewer MiG farms reported participating in crop insurance programs (35% vs. 44%) perhaps reflecting the smaller proportion of MiG farms raising corn (66% vs. 79%). Similar proportions of MiG and non-MiG farms reported spreading manure on pastures (83% vs. 80%). There were few differences between MiG and non-MiG farms regarding participation in government conservation programs such as Conservation Reserve Program (CRP) (7% for both). Conservation program enrollment averaged 32 acres for MiG farms compared to 22 acres for non-MiG farms. Fourteen percent of MiG farms reported using organic production practices versus 1% of non-MiG farms.

Herd Size Comparison

Figure 1. Herd sizes on MiG and non-MiG dairy farms.

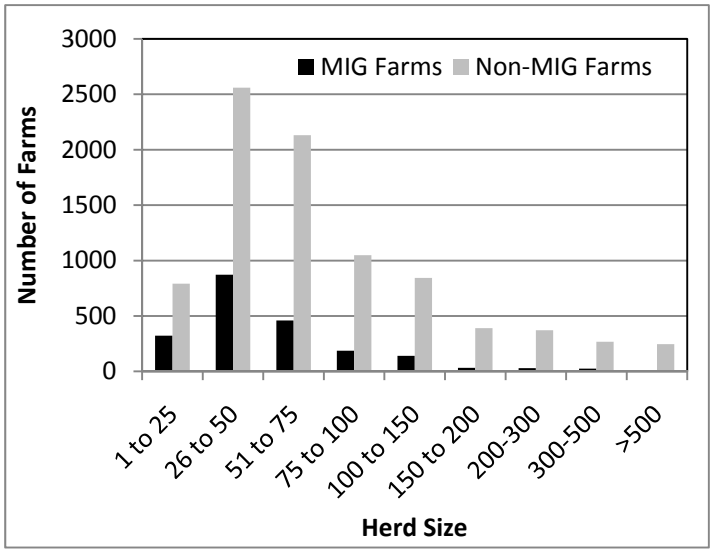
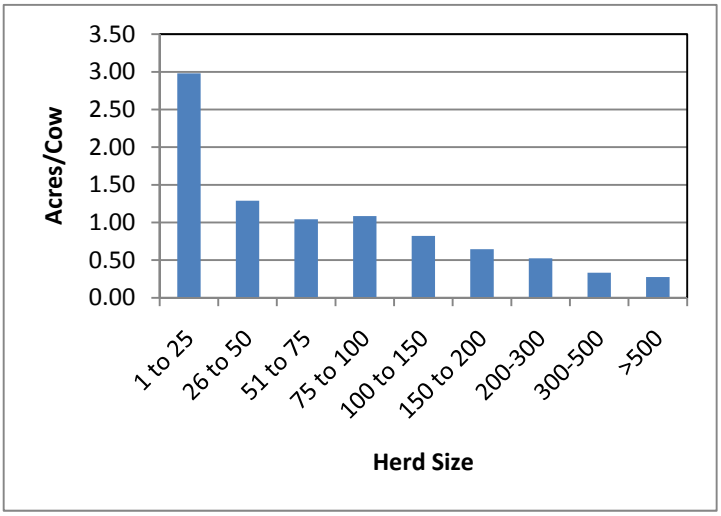


Figure 1 shows the breakdown of MiG and non-MiG dairy farms by size. The proportion of farms in each size category follows a similar pattern for both types, with the largest number of farms having milking herds averaging between 26 and 50 cows. There were fewer very large farms using managed grazing. Ten percent of non-MiG farms averaged over 200 milking cows compared to only 3% of MiG farms. Among the largest MiG farms, thirty milked between 200 and 300 cows, 25 were between 300 and 500 cows, and 10 farms milked over 500 cows.

Figure 2. Acres per milking cow on MiG farms.



In Figure 2, average pasture acreage per cow is shown by herd size. The acreage per cow declined with increasing herd size. A common rule-of-thumb suggests that one acre of pasture is needed per cow to provide adequate grazing acreage for the growing season. The smallest grazing dairy farms with fewer than 26 cows had nearly three acres of pasture per cow. Farms between 26 and 100 cows averaged between one and 1.3 acres per cow and the five largest herd sizes had significantly less than the recommended acreage per cow.

Financial Performance

The 2007 Ag Census asked for cost of production information in 11 categories (see Table 3). Similar to data collected by the Center for Dairy Profitability (Kriegl and McNair 2005), cost of production per cow for MiG farms was lower at $2730 than for non-MiG farm, which was $3116 per cow. Hired labor accounted for the most significant cost difference ($439 vs. $635 for MiG and Non-MiG respectively). Of the 11 categories surveyed, MiG farms had lower costs by 10% or more in five categories. Fuel and repair costs were slightly lower. Utility and fertilizer costs averaged slightly higher (4 and 6 percent respectively).

Table 3. Production costs for MiG and non-MiG dairy farms reported in the 2007 Census of Agriculture.

Cost Category	MiG Dairy Farms	Non-MiG Dairy Farms	Percent MiG: Non
Hired labor	$439	$635	0.69
Feed cost	$626	$732	0.86
Equipment rent	$114	$129	0.88
Custom work	$128	$144	0.89
Chemical cost	$89	$99	0.90
Land & facilities rent	$178	$194	0.91
Depreciation	$415	$444	0.93
Fuel cost	$158	$163	0.97
Repairs cost	$301	$304	0.99
Fertilizer cost	$180	$172	1.04
Utilities cost	$104	$98	1.06
Total	$2730	$3116	0.88

Demographics

There were no differences between MiG and non-MiG farms for most demographic questions. Operator age averaged 51. Farmers in both categories reported an average of 35 days worked off farm per year and reported that 75% of their household income was from farming. Only 6% of all operations reported

that the majority of their income was from off-farm sources. About 59% of households reported having internet access and 28% reported having a high speed connection.

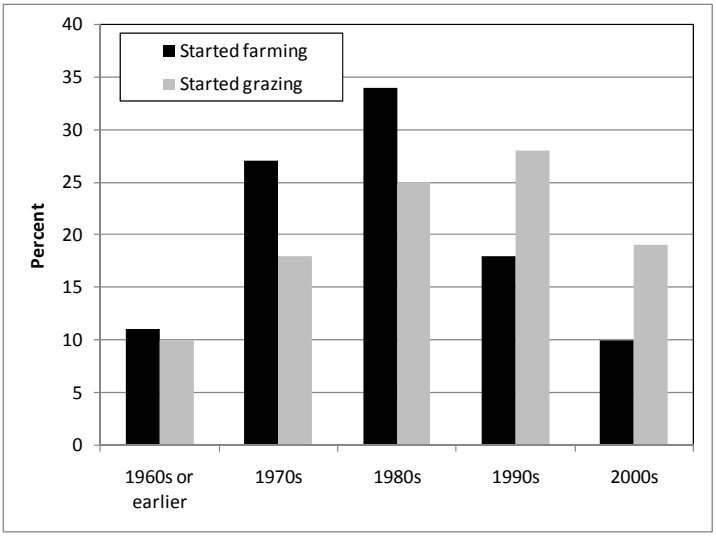
How graziers manage their farms

Data from the 2010 grazing dairy survey

Timing and Motivation for Adoption of Managed Grazing

Among the 771 respondents to our 2010 grazing farmer survey, a majority of these MiG farmers (64%) began using a managed grazing system when they started farming. Nineteen percent reported that they transitioned to managed grazing within ten years of starting farming, 9% transitioned from 11 to 20 years later, and 8% began using managed grazing more than 20 years into their farming career. Figure 3 shows adoption of MiG over time among respondents. Adoption of MiG by survey respondents peaked in the 1990s with 30% reporting adoption of MiG during that decade. Lower MiG adoption rates in the 2000s may be the result of several factors including the overall decline in number of dairy farms in Wisconsin. During that decade the total number of dairy farms declined 37% from 22,576 in 1997 to 14,158 in 2007 (US Census of Agriculture). The proportion of dairy farms using MiG as of 2007 was estimated at 22%.

Figure 3. Timing of adoption of managed grazing.



Graziers were asked why they started grazing and what their level of satisfaction was with their grazing system. Among the four choices, improving animal health (80%) and reducing production costs/increasing net income (79%) were checked by the most respondents. Reducing labor/more time for my family was checked by 71% of respondents. Nearly half of graziers (46%) cited improving environmental performance as a primary reason that they switched to managed grazing. Eighty-nine percent said they were satisfied or very satisfied with their systems.

Forty-one percent of respondents said that they would like more information provided by agencies. Current sources of information in order of usage were: magazines, books and newspapers (69%), pasture walks (33%), conferences (18%), field days (17%), internet (11%), workshops (10%), and other (9%). Seventeen percent of respondents reported having had assistance in developing a managed grazing plan by a trained grazing specialist or planner.

Pasture management

Pasture rotation. In managed grazing, pasture productivity is maximized by providing adequate time for rest and regrowth between grazing events. To achieve this, the pasture is divided into sections or paddocks that are typically one to five acres in size, depending on herd size. For optimal pasture management, the recommendation is to rotate (move) cattle to a new paddock at least every three days, to avoid the risk of grazing new pasture regrowth (Undersander et al 2002). Rotation from a

paddock is followed by a period of rest typically of three to five weeks designed to allow plant recovery and accumulation of forage for the next grazing event. The more often the herd is moved, the more rest time each paddock receives, resulting in higher quality and quantity of pasture forage.

Nutritional quality of pasture is maximized when lactating cattle are moved to a new pasture every day or after every milking. Twenty-one percent of respondents to our survey reported moving their milking herd twice or more per day. Seventeen percent reported moving cows once a day. In contrast, 48% reported a rotation of three days or more on each paddock, with nearly half of these respondents reporting that they move their milking herd less often than once per week. Thirty one percent reported moving their dry cows every three days or less; twenty percent reported moving heifers that often.

Start and end of grazing season. A majority of respondents (58%) reported starting grazing in May, with 40% starting in April, and 2% starting in March. Forty-nine percent of MiG farms graze cattle into November, while 44% end their grazing season in October. Six percent reported taking cattle off pasture in September. Twenty percent of respondents reported use of stockpiling to extend the grazing season.

Stocking rate and pasture acreage. Stocking rate (acres/cow) decreased with increasing herd size. Stocking rates are calculated by dividing total pasture acres by the sum of all animals on the farm (lactating cows, dry cows, and replacement heifers). Farms with milking herds of 1-49 cows reported an average of 72 acres of pasture and had stocking rates of 1.19 acres/head. Farms with milking herds between 50 and 99 cows averaged 77 acres of pasture and 0.7 acres per head while farms with over 100 milking cows reported 132 acres of pasture and had 0.47 acres per head on average. These trends are very similar to those reported in 2007 Census of Agriculture.

Pasture management and renovation methods. The survey asked respondents about their use of a series of common and not-so-common grazing practices. Fifty-four percent of respondents reported use of permanent paddock divisions, suggesting that the remaining 46% made use of temporary fencing (e.g. polywire and fiberglass posts) for dividing larger pasture areas into paddocks.

About two thirds (65%) of respondents indicated that they provide water on pasture.

Strip grazing, the division of a pasture area into narrow strips, and moving the herd from one strip to the adjacent one using temporary fencing, was used by 32%.

Mob grazing is a relatively new practice involving very high stocking densities (100,000 or more pounds of cattle per acre) for short periods of four to six hours. Advocates of this practice report better forage utilization, better weed control and improved pasture plant community diversity and health. This practice is used by 28% of respondents.

Eighteen percent of respondents use a leader/follower system. Leader/follower grazing is the practice of grazing two herds of animals through a pasture simultaneously, one immediately following the other. The leader herd generally has a higher nutritional need such as the milking herd, and is allowed to graze off the highest quality top growth and is then moved on. The follower herd is a group of lower nutritional need animals such as heifers and dry cows. They graze down the pasture to the desired residual level, consuming the lower quality material.

Leaving adequate residual following grazing is essential for rapid recovery and regrowth. The recommendation is to leave no less than four inches or half of the grass leaf area. Residual heights of

four to five inches were reported by 35% of respondents, six to seven inches by 12%, and eight to nine inches by 2% of respondents. Fifty percent of respondents reported leaving a residual height of less than four inches after grazing a paddock.

Of the acres of pasture reported by survey respondents, 68% was dedicated solely to grazing, with 28% of the pasture acres used both for grazing and hay production. Four percent of grazed acres were used in rotation with row crops. Fifty-nine percent of respondents reported never rotating pastures with row crops, and 24% reported rotating from pasture into row crops once every four or more years, 16% every two to three years, and only 1% rotated annually between pasture and row crops on some acres.

Pasture renovation can also be achieved by introducing new species into existing pasture sod. However, more than half of respondents reported never frost seeding (65%) or interseeding (57%) to renovate pastures. Frost seeding is the application of seed in early spring by broadcasting over existing pasture. Red and ladino clover are most commonly used and the goal is to have the freezing and thawing of the ground in early spring work the seed into the soil, allowing for better seed-to-soil contact. While mechanically interseeding into sod with a no-till drill has a higher success rate, frost-seeding is less costly. Among farms using these pasture renovation practices, about 13% do so annually, 44% do so every two to four years, and about 24% frost-seeding or interseeding pastures every 5 years or more.

Soil testing is used by 49% of respondents, with 44% reporting using nutrient management planning and 42% using commercial fertilizer on pastures. Two percent reported using pasture irrigation.

Winter management. Twenty-three percent of respondents reported outwintering their cattle. Outwintering is the practice of feeding livestock outdoors during the winter months. Outwintered cattle are either rotated through a series of paddocks where bales are set out in advance or they are set stocked on a 'sacrifice paddock' that is then renovated the following growing season. Twenty seven percent of respondents reported using sacrifice paddocks, 33% use bedded packs, 23% use windbreaks and 7% use compost barns in their wintering system.

Milk production, breeds, and cross breeding. Milk production per cow increased as herd size increased with rolling herd averages of 14,040 lb for herds of 1 to 49 cows, 15,217 lb for herds of 50-99 and 17,042 lb for herds greater than 100 cows. Thirty-six percent of respondents reported using DHIA to monitor their milk production and quality. Average culling age for all herds was reported as 6.4 years, or more than four lactations, significantly higher than the national average of 1.8 lactations (Hadley et al 2006). Respondents reported a variety of breeds (Table 4).

Forty-eight percent of respondents reported using cross-breeding in their herds and 27% listed cross-breds as the primary "breed" in their herd (Table 4). Holstein-based herds were most common (62%) with Jersey-based herds comprising 12% of grazing herds. Other breeds listed in proportions less than 5% included Guernsey, Brown Swiss, Milking Shorthorn, Ayrshire, Normande, and Dutch-belted. The rolling herd average (RHA) of Holstein herds averaged 16,476 lb while RHA of Jersey herds averaged 13,043 lb, and cross-bred herds averaged 13,983 lb, suggesting a strong Jersey influence in cross-breeding programs. All other breeds reported significantly higher butterfat and somewhat higher protein levels than Holstein herds.

Twenty-nine percent of farms reported retaining and finishing steers for meat to diversify farm income. Of those 45% of farms finished their steers on pasture, 48% finished in feedlots, and 7% reported using a combination of both.

Table 4. Breakdown of MiG farms by breed (total of 538 respondents to this question).

Breed	Farms	Percent of all herds	Average herd size	Average weight	Culling age	Milk production	Butterfat	Protein
Holstein	331	0.62	50	1351	6.1	16,476	3.84	3.11
Jersey	65	0.12	45	1072	6.9	13,043	4.54	3.53
Guernsey	7	0.01	38	1183	5.7	14,510	4.64	3.43
Brown Swiss	17	0.03	43	1375	6.9	16,282	3.95	3.12
Milking shorthorn	9	0.02	56	1161	6.8	12,386	4.06	3.23
Other*	15	0.03	47	1240	6.6	16,021	4.03	3.29
Cross-breeds	147	0.27	48	1206	6.5	13,983	4.05	3.22
All breeds	538	1.00	49	1275	6.4	15,430	3.98	3.19

*includes red & white Holstein, Ayrshire, Normande, and Dutch belted.

Cattle rations and supplementation

The proportion of pasture in the diet of lactating animals during the grazing season was 66% for the smallest herds (1-49 cows) and 49% for both of the larger herd sizes. Most respondents reported their target pasture dry matter intake (DMI) as higher than actual, with herds 1-49 cows having an average goal of 74% of pasture DMI in the ration, compared to 65% target DMI for herds with 50-99 cows, and 55% for herds of greater than 100.

Corn silage feeding increased as herd size increased. Only 35% of the smallest farms reported use of corn silage in their lactating cow ration compared to 71% of the largest farms. Use of other feedstuffs in rations was similar among herd size categories, averaging 65% for hay and haylage, 9% for soybean meal, 59% for grain, and 4% for distillers by-products. An average of 35% of respondents reported feeding a total mixed ration.

Smaller farms (herd sizes of 1-49 and 50-99) were more likely to feed a similar ration to dry cows and heifers than the largest size category (>100). The largest farms substituted hay and haylage for corn silage in their rations for dry cows and heifers and were less likely to report feeding grain to these classes of livestock.

About 15% of all herds reported feeding no grain to their lactating cattle, although some of these herds may receive corn in the form of silage. The average of no-grain herds was higher among smaller herds, with 18% of herds with 1 to 49 cows, 14% of herds of 50 to 99 cows, and 12% of herds of more than 100 cows reporting a no-grain ration.

Summary

Results of both surveys indicate that farms using management intensive grazing are successfully substituting fresh pasture for half or more of their dairy cow ration during the months when pasture is available. Producers are motivated to use MiG by animal health improvement, increasing net income, and reducing labor. While neither survey was designed to determine whether these goals are realized, a 91% satisfaction level among respondents suggests that responding MiG farms are meeting their personal farming goals through use of managed grazing.

As with any survey group, there is a range of producer knowledge and skills represented and interest in improving their management. Forty-one percent of respondents said they were interested in more information. Nearly all respondents reported that the pasture intake of their cattle was lower than desired. Both surveys identify areas where additional information and assistance could be helpful in making producers' systems more efficient and effective. Several areas could be targeted for educational resources. Pasture management is a primary one, with nearly half of MiG producers rotating less often than every three days and more than half of respondents indicating that they do not currently take advantage of other practices that increase productivity and quality such as frost- or inter-seeding, fertilization, and nutrient management planning. This has an impact not only on pasture productivity, but on forage quality, which in turn impacts milk production. Milk production was relatively low for all but the largest MiG herds, and a combination of improving pasture quality and more information on ration balancing on pasture could help boost production with relatively little cost.

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