Grazing in the dairy state

Pasture use in the Wisconsin dairy industry, 1993-2003

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Executive summary

Managed grazing is a business model that can be used as part of a sound strategy to provide a steady milk supply for Wisconsin. As farm numbers continue to decline and herd sizes grow in an effort to maintain the state's milk production and processing sector, it becomes increasingly important to know what factors contribute to successful dairy enterprises. As recently reported in *Pastures of Plenty* (Kriegl and McNair, 2005), a decade of study has shown that managed grazing farms have been consistently profitable. What do these farms look like? Are they similar to or different from other types of Wisconsin dairy farms?

This report summarizes statewide information about Wisconsin dairy producers who use pasture and managed grazing as feeding and farm management tools. By placing their farm operations in context, it will become possible to envision how grazing enterprises can contribute significantly to the health of the dairy industry and rural communities. Note that environmental impacts are not discussed in this document as research addressing grazing-related environmental issues such as nutrient management, water quality and species diversity is ongoing and warrants a separate report.

While managed grazing is sometimes perceived as outside of mainstream agriculture in Wisconsin, **graziers are more similar to other dairy farmers than they are different**. In terms of age, farming background, household income, off-farm work and technology use, dairy farmers using managed grazing are, on average, not strikingly different from many farmers who operate more traditional dairy and cropping systems.

Data collected by the UW Program on Agricultural Technology Studies (PATS) from 1993 to 2003 (see Appendix A) shows that farm size, rather than other characteristics, is the primary difference between graziers and non-graziers in Wisconsin. The other major findings are that **graziers earn similar household incomes with half the number of cows, have less debt, and are more satisfied with their overall quality of life than other types of dairy farmers.**

In sum, Wisconsin graziers are equally or more profitable than other dairy farmers in the state. Farmers succeeding with managed grazing usually do so with moderate herd and farm sizes, little hired help and only slightly more off-farm employment than non-graziers. A typical grazing farm is a small business operation run by a single farm family. Wisconsin also has a variety of support mechanisms in place to assist beginning farmers and farmers transitioning to grazing.

Thus, discussion of stabilizing and possibly increasing milk production, stemming the decline of farm numbers and preserving working lands in Wisconsin should include a managed grazing dairy enterprise model.

Definitions

For this report, Wisconsin dairy farmers are divided into three categories based on feeding management.

The following definitions are fully explained in the main text on page 2 and presented here in brief:

Management intensive grazing (MIG), or managed grazing, is a system in which dairy farmers rely on pasture as the primary source of forages for their milk cows during the grazing months and move these cows to fresh pastures at least once a week. The farmers who practice it are **graziers**.

Conversely, **stored feed** dairy farm operations do not rely on pasture for any part of the forage ration for their milk cows. **Mixed feed** refers to dairy farm operations that feed primarily stored feed, but obtain part of the forage ration for their milk cows from pasture. These farmers rotate their cows to fresh pasture less than once a week**. The managed grazing and mixed feed categories together will be referred to as farms that use pasture.**

Grazing dairy farms

Managed grazing is an important and dynamic part of the Wisconsin dairy industry. **Managed grazing was practiced on about 23 percent of Wisconsin dairy farms, or about 3,900 operations, as of 2003.** Another 21 percent of dairy farms were mixed feed operations, bringing the number of dairy farms using pasture in the state to an estimated 7,416 farms. While the total number of dairy operations dropped steadily from about 30,000 in 1993 to 16,900 in 2003, the number of dairy farms using managed grazing increased rapidly in the early 1990s and remained a consistent 22 to 23 percent of the total from 1999 to 2003 (Fig. 1, page 3).

In 2002, managed grazing farms were about the same acreage as mixed feed operations, but stored feed operations averaged 150 acres more per farm. From 1993 to 2002, the average size of managed grazing and mixed feed farms decreased slightly to 245 and 277 acres operated per farm, respectively. During the same time, the average size of stored feed operations increased by about 75 acres per farm, from 350 acres to 426 acres (Fig. 8, page 11). Farms using pasture were most numerous in the South West, West Central, North Central and North West Crop Reporting Districts, where between 46 and 68 percent of dairy farms used pasture for their milk cows (Fig. 2, page 4). Graziers made up 30 to 37 percent of the dairy farmers in the South West, West Central and North Central Districts, which are the same regions where managed grazing has been used the most in Wisconsin since the early 1990s.

Milk cows on pasture

Farms using pasture devoted an average of 35 acres of pasture per farm for milk cows, with managed grazing operations using more than mixed feed operations. In sum, approximately 136,000 acres of pasture were used by dairy graziers and another 122,500 acres of pasture were used on mixed feed operations in Wisconsin in 2002. These are rough totals, and likely underestimate the actual acreage as few large grazing operations were surveyed.

In 2002, 26 percent of Wisconsin's 1,265,000 dairy cows used pasture as part of their feed ration. About half of these cows were fed using managed grazing. Consistent with having the most farms using pasture, the South West District also had the most dairy cows using pasture—50 percent. The North Central, the West Central and the North West

Districts followed with 44, 33 and 28 percent of dairy cows, respectively, obtaining forage from pasture (Fig. 3, page 5). These four districts also had more dairy cows on managed grazing farms than the other five districts in Wisconsin.

Wisconsin graziers had the same number of cows as mixed feed farm operators, but fewer than half as many cows as stored feed operators. The average herd size on a managed grazing farm in 2002 was 48 cows, up about 7 cows per herd from 1993. The herd size on mixed feed farms remained fairly steady during the decade and averaged 49 cows in 2002. Meanwhile, stored feed operations trended toward larger herd sizes, growing from an average of 58 cows per herd in 1993 to 108 cows per herd in 2002 (Fig. 9, page 11). This average was pushed up by the relatively small number of larger herds. Seventy percent of stored feed operations in Wisconsin in 2002 remained at fewer than 100 cows (Fig. 10, page 12).

Farmer characteristics

Farmers who practiced managed grazing were similar to other dairy farmers in terms of age, farm background and years of farming experience. On average, the primary operator of a Wisconsin dairy farm was 48 years old, grew up on a farm and had 21 years of experience managing the farm he or she currently operates. Graziers as a whole were not significantly different in these respects; they were slightly less likely to come from a farm background and the most intensive graziers were, on average, two years younger than other dairy farmers.

Technology and labor

Technology use by graziers was appropriate to their management systems. Graziers were nearly as likely as stored feed farmers with similarly sized operations to use farm production records and milking parlors, both of which can improve labor efficiency and herd management. Graziers were the least likely to use rBST or TMR machinery, consistent with their smaller herds and use of pasture as the primary forage during the grazing season.

Graziers and mixed feed farmers were less likely than stored feed farmers to hire non-family labor. About 9 percent of graziers and 18 percent of mixed feed farmers hired regular non-family employees compared with 33 percent of stored feed farmers. Farms with 200 or more cows accounted for most of the paid employees, averaging six per farm. On dairy enterprises with under 100 cows, less than one full-time equivalent employee was hired for the year.

Production and performance

About 23 percent of the state's milk production in 2002 is estimated to have come from cows on pasture. Eleven percent was from managed grazing operations and 12 percent was from mixed feed farms. Milk production per cow on grazing farms was usually lower than on other types of dairy operations. For 2002, graziers reported an average of 17,500 pounds per cow annually compared to 18,200 pounds per cow reported by mixed feed farms and 20,700 by stored feed farms. However, graziers' average cost of production was lower, yielding more profit per cow and per hundredweight of milk than other types of dairy farmers.

Snapshot of Wisconsin Dairy Farms, January 2003 (Averages* in each category; actual farms vary)	Managed grazing	Mixed feed	Stored feed
acres operated	245	277	426
number of milk cows	48	49	108
milk production (lbs./cow/year)	17,500	18,200	20,700
age of operator (years)	48	47	49
operator farm background (% yes)	85	90	91
operator experience (years)	20	20	22
hire regular help (% of farms)	9	18	33
household income range (annual)	$35,000-$49,000	$35,000-$49,000	$35,000-$49,000
no farm debt (% of farms)	27	28	20

*the average refers to the arithmetical mean

In terms of financial performance, **graziers reported total family income for 2002 in the same range as stored feed and mixed feed farm households.** On average, Wisconsin dairy farm households of all types reported incomes in the range of $35,000-$49,000. This included the family's share of net farm income as well as off-farm wages and any income from other sources. **Thus, graziers earned average family incomes similar to that of stored feed operations with less than half as many cows.**

Wisconsin dairy farmers earned 80 to 88 percent of their household income from farming. On average, graziers received only five to eight percent more of their household income from non-farm sources than other dairy farmers. Among all types of dairy farm families, steady off-farm work, usually by the spouse of the primary farm operator, contributed an average of 11 to 14 percent of household income. Dairy farm families worked off farm mainly for health insurance coverage, to offset low milk prices and to supplement farm income.

Another indicator of financial performance was the debt load carried on dairy farms. **Twenty-seven percent of graziers reported no farm debt as of January 1, 2003, up from 22 percent in 1993.** About 20 percent of stored feed farmers were out of debt, the same as ten years prior. Twenty-four percent of graziers carried debt loads of under 10 percent of the total value of their farm assets, compared with 19 percent of mixed feed and 18 percent of stored feed operators (Fig. 5, page 8). Overall, graziers reduced their debt loads during the decade, with 15 percent fewer graziers in 2003 having debt over 40 percent of the total value of their farm assets.

Satisfaction and outlook

Many factors contribute to a family's decision to farm, including how farming fits with their lifestyle and goals, the skills and background of the operators and many other qualitative assessments. In 2003, about two-thirds of dairy farmers reported being moderately satisfied with their quality of life, while 21 percent of farmers were dissatisfied. Stored feed operators were more likely to be 'very dissatisfied' than graziers. Conversely, **graziers were more likely to report being 'very satisfied' than other dairy farmers, with 15 percent of the graziers being 'very satisfied'** (Fig. 6, page 9).

Wisconsin dairy grazing at a glance (2002)

- Forty-four percent of dairy farmers feed pasture to milk cows.
- Managed grazing is practiced on 23 percent of dairy farms.
- Twenty-six percent of the state's 1,265,000 dairy cows use pasture as part of their feed ration.
- Twenty-three percent of the state's milk production comes from cows on pasture, with 11 percent from farms using managed grazing.
- Milk cows use at least 258,500 acres of pasture.
- In the South West Crop Reporting District, 68 percent of dairy farms and 50 percent of milk cows use pasture.
- Eighty percent of the household income of graziers comes from farming.
- Graziers are more likely to report being 'very satisfied' with their lifestyle than other dairy farmers.

When asked how their quality of life changed over the previous five years, only about a quarter of dairy farmers reported it had gotten better, while 31 percent said it had gotten worse. The survey was distributed in 2003 following particularly low milk prices in 2002 and 2000. Graziers, especially the most intensive, were the least likely to say that their quality of life had gotten worse. No matter what their farm management style, dairy farmers were less satisfied overall than in past years. Eighty-three percent of dairy farmers said that they were 'very dissatisfied' with the price they received for milk and 60 percent were 'very dissatisfied' with their net farm income.

About a third of dairy farmers expected to be farming for four to ten more years and some were optimistic enough to say they would continue farming indefinitely. Graziers were more likely than stored feed operators to indicate they could farm indefinitely. **Yet among all dairy farmers polled, 41 percent said they planned to discontinue dairying in three years or less**.

While the number of retirees may differ from this projection, a dramatic decline in farm and farmer numbers may be coming. One concern is that if the milk supply drops, the Wisconsin dairy processing industry—already operating at about fifteen percent less than full capacity—may decline. This would lead to the loss of dairy processors, jobs and supporting infrastructure.

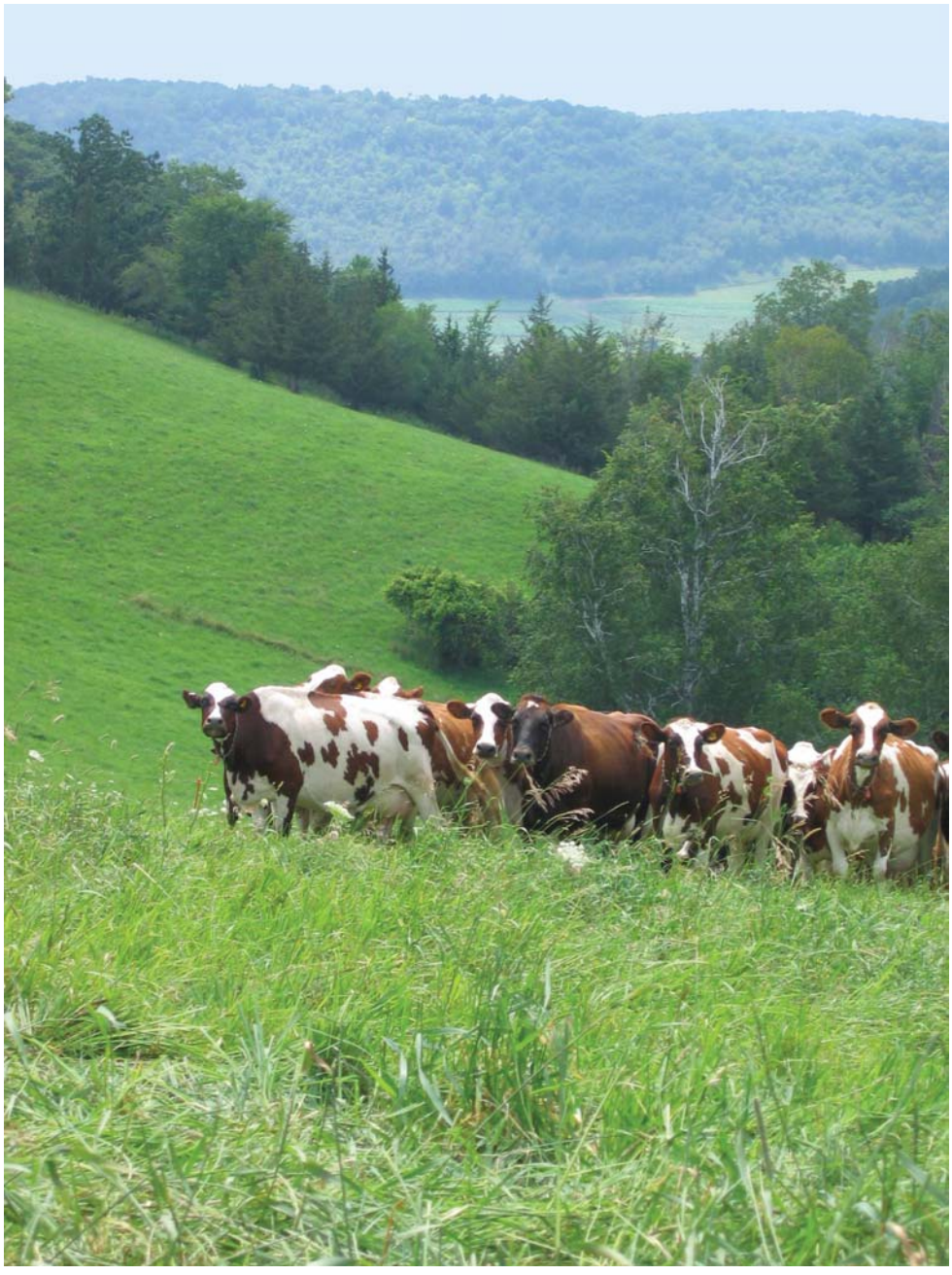
Wisconsin dairy farmers have a strong record of environmental stewardship, active participation in their communities and growing interest in value-added products. It is clear that the $21 billion dairy industry plays a vital role in the well-being of the state. As farmers of all management types struggle to maintain their viability, business, policy, educational and research sectors need to cooperate in the development and promotion of profitable and sustainable dairying systems. Managed grazing is one path to strengthening Wisconsin's dairy sector.

Introduction

Management intensive rotational grazing, MIG, grass-based or pasture-based farming … by whatever name you call it, managed grazing has spread throughout the state and is now an established practice on many Wisconsin dairy farms. There are grazing networks, equipment suppliers, researchers and consultants across Wisconsin who provide information and infrastructure for grazing operations of all sizes and types. However, questions and misconceptions about grazing remain. Does managed grazing pay as well as conventional dairying? Aren't graziers a very different population from other dairy farmers? What about milk production from pasture—it's only a drop in the bulk tank of Wisconsin's total milk supply, right?

These questions and more were addressed by examining ten years of survey data from the Program on Agricultural Technology Studies (PATS) at the University of Wisconsin–Madison (see Appendix A). In contrast to the conventional wisdom about graziers, the use of high quality pastures as a feeding and management tool in Wisconsin is not limited to a few atypical farmers.

Nearly one-fourth of Wisconsin's milk production comes from farm families using pasture. Their dairy farms are much like their neighbors' farms of similar size, except that they use pasture. And graziers make more money per cow and have less enterprise debt than other dairy farmers. Let's take a closer look.



Grazing definitions—What is managed grazing?

Management intensive grazing (MIG), or managed grazing, is a system in which dairy farmers rely on pasture as the primary source of forages for their milk cows during the grazing months and move these cows to fresh pasture at least once a week. The farmers who use this management system are called **graziers**. Dairy cows, heifers, beef cows or stockers, sheep, poultry and other animals can be fed successfully using managed grazing. We recommend that 'managed grazing' be used as the term of choice and that the above definition be applied consistently to dairy enterprises that use this system in future studies and publications.

On the opposite end of the spectrum, **stored feed** farm operations do not use pasture for any part of the forage ration for their milk cows. These have most often been referred to as 'confinement' farms when compared with grazing farms. The problem with using the term confinement in this manner is that, for the purposes of a managed grazing discussion, it refers only to confinement feeding and not to confinement housing. Housing practices often get folded into discussions of confinement versus grazing approaches; however, they are distinct from the feed-based definitions used to categorize farms in this report. Thus, stored feed refers to the exclusive feeding of harvested feed and does not distinguish between housing practices, nor does it specify that cows are always inside.

Mixed feed farms obtain part of the forage ration for their milk cows from pasture, but mostly use stored feed. Graziers often supplement their cows' nutritional needs with varying amounts of stored concentrates or additional forages such as corn silage. Mixed feed farmers, however, rotate their cows to fresh pasture less than once a week and pasture is not the primary source of forages for their milk cows.[1]

Finally, we will talk about mixed feed and managed grazing farms together as operations that **use pasture**. For example, in order to estimate the total number of acres of pasture used for milk cows on Wisconsin dairy farms, we added the responses of graziers and mixed feed farmers. This classification is based on using pasture for milk cows; any of these types of dairy farms may use pasture for dry cows, heifers or steers.

[1] Previous publications from the Program on Agricultural Technology Studies refer to mixed feed farms as 'non-intensive grazing' operations.

Scope of grazing—Farm numbers, cows and milk production

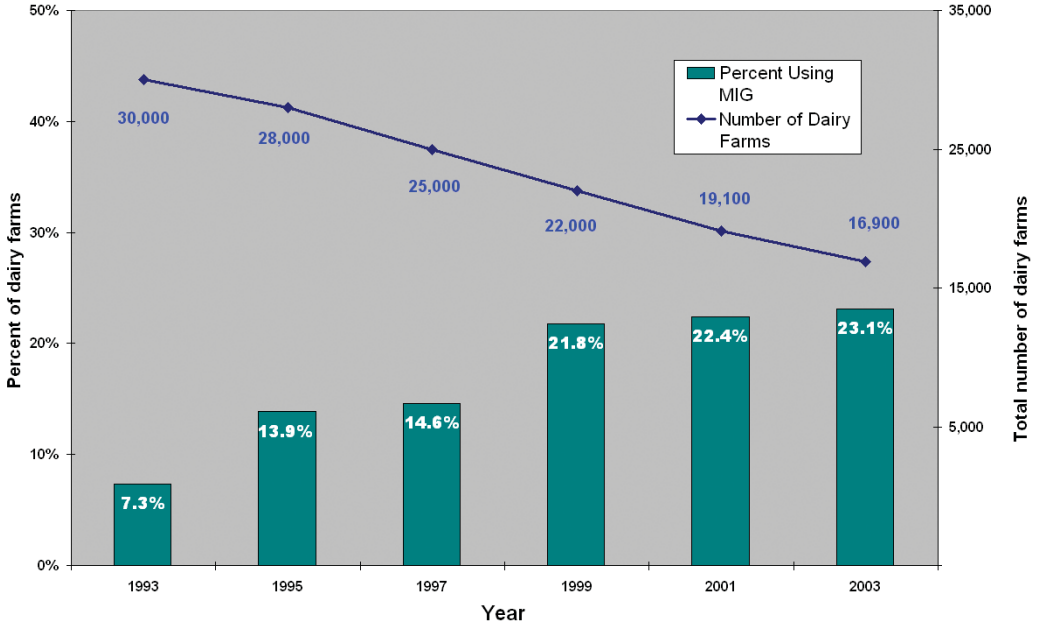
The 2003 Wisconsin Dairy Farm Poll (PATS) and 2004 Wisconsin Dairy Producer Survey (Wisconsin Agricultural Statistics Service, WASS) provide the most recent statewide statistics on dairy farms using pasture in Wisconsin. Except where indicated, the data in this report comes from PATS surveys between 1993 and 2003; the 2003 PATS survey collected some data from 2002 and some from 2003. As only dairy farms were surveyed, the number of farms, animals and acres of pasture used by beef and other livestock operations are not included. Dairy farmers' use of pasture for heifers and steers also was not addressed. These topics will be presented in future reports.

How many grazing dairy farms?

During the 1990s, increasing numbers of Wisconsin dairy farms used managed grazing, even as the total number of dairy farms continued to decline. **In the ten years that have been surveyed, the number of management intensive grazing farms increased from 7 to 23 percent of the dairy operations in the state** (from 2,200 operations to 3,900 operations) while the total number of Wisconsin dairy farms dropped from about 30,000 in 1993 to 16,900 in 2003 (Fig. 1).

Since 1999, the percentage of graziers has held steady, possibly because enterprises using managed grazing are not going out of business as fast as other kinds of dairy farms. Previous survey work showed that new dairy farm operators were more likely to use managed grazing than dairy farmers as a whole.[2] Recently, the state added grazing specialists and put hundreds of farms into grazing management plans, indicating that farmer interest in using improved pastures was strong through 2005.[3]

Figure 1. Use of management intensive grazing on Wisconsin dairy farms (1993-2003)



Mixed feed farms accounted for 21 percent of Wisconsin dairy farms in 2003, bringing **the total number of farms using pasture to approximately 7,400 or 44 percent of all Wisconsin dairy farms**. This is up from 37 percent in 1993, showing that even as dairy farms

[2] Ostrom, M., and D. Jackson-Smith. 2000. *The Use and Performance of Management Intensive Rotational Grazing Among Wisconsin Dairy Farms in the 1990s*. UW-Madison PATS.

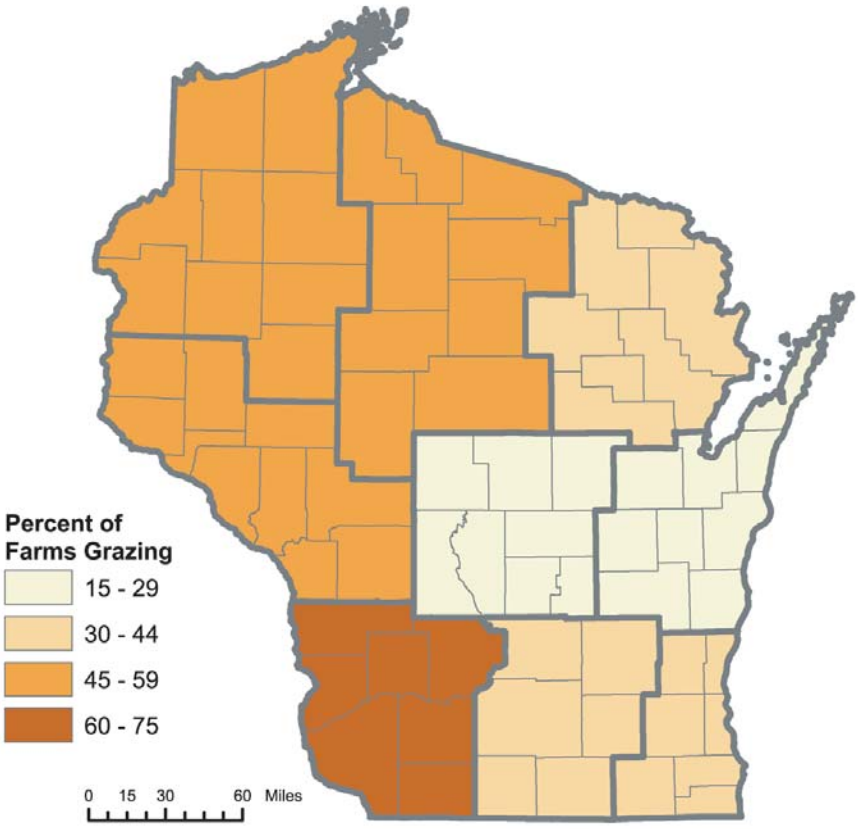
[3] Paul Daigle, Marathon County Conservation, Planning and Zoning Dept., and Brian Pillsbury, Natural Resources Conservation Service. April, 2005. Personal communication.

Key Finding: In 2003, nearly one-fourth of all Wisconsin dairy farms used managed grazing. Combined with mixed feed farms, 44 percent of all Wisconsin dairy farms used pasture.

modernize and expand, the use of pasture for milk cows is important to an increasing number of farmers.

The Wisconsin Agricultural Statistics Service (WASS) reports that about 14 percent of Wisconsin dairy farms used "intensively managed rotational grazing." This lower figure is not directly comparable to the number of graziers identified by the PATS surveys. The questions were phrased differently by each organization[4] and managed grazing was not defined by WASS. Those who identified themselves as using intensively managed rotational grazing in the WASS survey were likely a group of more intensive graziers similar to the 13.8 percent from the 2003 PATS survey who rotated their cows every four to six days or more. When looking at grazing in general, there was closer agreement between the organizations. In 1996, a WASS producer survey showed 48 percent of Wisconsin dairy farmers had milk cows grazing some pasture, similar to the 44 to 50 percent identified by PATS between 1995 and 2002.

Figure 2. Percent of farms using pasture for milk cows by Crop Reporting District, 2002



Each percentage is an average for the entire district and does not show county by county variation.

Where are the 7,400 farms using pasture located? Figure 2 shows that in 2002, the South West Crop Reporting District (CRD) had the highest percent of farms (68 %) with milk cows on pasture using managed grazing or mixed feeding. Pasture use was also high in the West Central (57%), North Central (57%) and North West (46%) Districts. The portion of farms using managed grazing is highest in three of these districts with 30 to 37 percent of the dairy farms in the South West, West Central and North Central regions using managed grazing.

[4] WASS 2004 Dairy Producer survey asked: "Do you use intensively-managed rotational grazing?"; PATS 2003 Wisconsin Dairy Farm Poll asked "During the 2002 grazing season, did you rely on pastures for at least part of the forage ration for any of your milking cows? a. If so, were pastures the primary source of forages for your milking herd during the grazing months of 2002? b. How often did you usually move your grazing milk cows to fresh pastures (or a new paddock)?

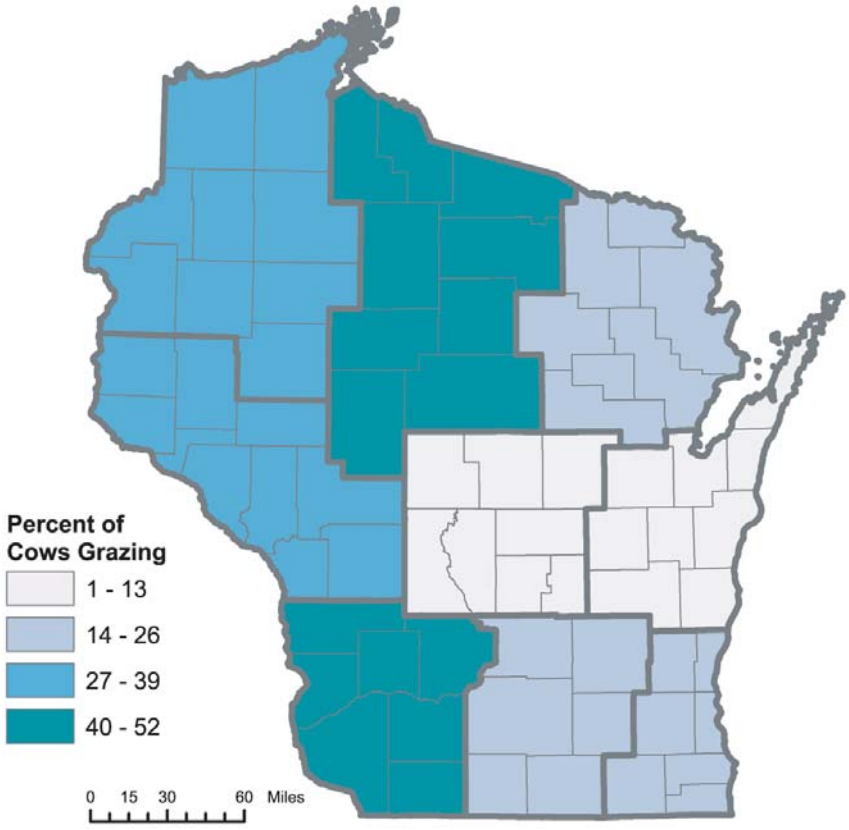
Key Finding: About 26 percent of Wisconsin's milk cows were fed pasture; 14 percent by managed grazing methods.

Large numbers of stored feed and managed grazing operations are located in the North Central and West Central Districts, indicating that these management styles can and do coexist. Cooperation benefits both types of dairy farmers. For example, graziers often purchase feed or hire custom harvesting from nearby farms, while stored feed farmers have benefited from contracting with their neighbors to raise their heifers on pasture.[5]

How many acres are used for grazing?

Both the PATS and WASS surveys found significant acres in pasture. As a managed crop, WASS found that pasture ranked first in acreage in 2000. Comparing pasture production to mechanically harvested crops, WASS data showed that more acres of pasture were grazed by all livestock than harvested for any other crop, including hay or corn for grain.[6]

Figure 3. Percent of milk cows using pasture by Crop Reporting District, 2002



Each percentage is an average for the entire district and does not show county by county variation.

PATS found that roughly 260,000 acres of pasture were used by Wisconsin farmers as feed for their milk cows. About half of this pasture was intensively managed: approximately 136,000 acres by the PATS definitions or 115,000 acres according to WASS.[7] Again, these numbers are minimums and did not include pasture grazed by heifers, beef cattle or other types of livestock. Determining the numbers of acres used by these enterprises is an important next step.

How many cows are on pasture?

About 26 percent of Wisconsin milk cows were fed pasture in 2002. Fourteen percent were grazed using managed grazing methods. The highest concentration of dairy

[5] Kim Pokorny, press release. Professional Dairy Producers of Wisconsin Annual Business Conference. March 9, 2005. Madison, WI.

[6] Wisconsin Agricultural Statistics Service, news release, May 3, 2001.

[7] WASS 2004 Dairy Producer Survey. December, 2004. Madison, WI.

Key Finding: In 2002, dairy operations using pasture contributed 23 percent of the state's milk production, with milk from managed grazing farms accounting for 11 percent of the total.

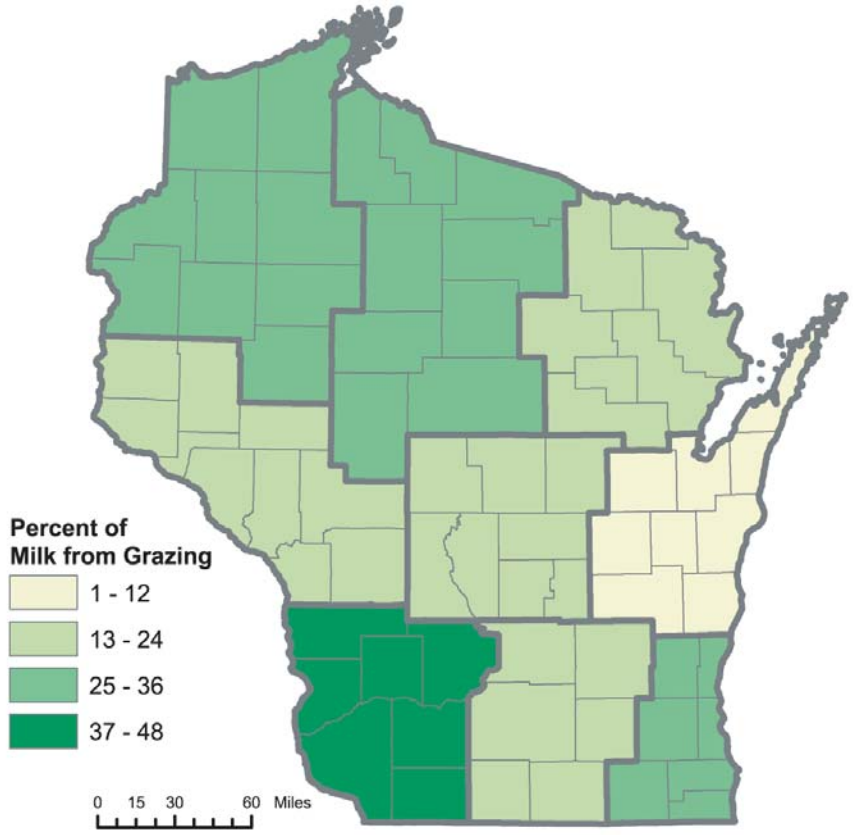
cows on pasture was in the South West CRD where 50 percent of the cows used pasture, and the North Central CRD where 44 percent used pasture. Thirty-three percent of all dairy cows in the West Central District and 28 percent in the North West were fed pasture (see Fig. 3 on page 5). Managed grazing was highest in three of these areas, with 21 to 31 percent of dairy cows in the South West, West Central and North Central Districts fed pasture as their primary forage.

How much milk comes from pastured cows?

In 2002, dairy operations using pasture contributed 23 percent of the state's milk production, with managed grazing accounting for 11 percent of the total. In four of the nine CRDs, farms using pasture generated roughly a third of the milk produced in that district. Forty-four percent of milk in the South West District, 36 percent in the North Central, 30 percent in the South East and 29 percent in the North West came from pastured cows (Fig. 4). Cows on managed grazing farms produced 16 to 20 percent of the milk in the South East, South West and North Central Districts.

Farms using managed grazing and mixed feed systems contribute a significant portion of the state's milk. As Wisconsin strives to preserve farms and farmland, maintain a vigorous milk supply and processing sector, and revitalize rural communities, farms using pasture should be an integral part of the future landscape. As detailed in the next section, managed grazing provides a comparable income to other dairy systems. Graziers can maintain a moderate herd size, while earning more money per cow.

Figure 4. Percent of milk produced on farms using pasture by Crop Reporting District, 2002



Each percentage is an average for the entire district and does not show county by county variation.

Financial performance—Is managed grazing profitable?

The success of dairy farms depends on the ability of farmers to stay in business, earn a reasonable income and enjoy a good quality of life. No farm management style can guarantee good financial performance or life satisfaction. Grazing, however, can provide a comparable income to other management systems, and graziers are more likely to be very satisfied with their overall quality of life than other dairy farmers.

Income

Wisconsin dairy farmers reported an average total annual family income[8] of $35,000-$49,000 in 2002. This average was the same for all types of dairy farms, although stored feed farms were more likely to be at the upper end of this range. However, on average, stored feed farmers and graziers cited family incomes in the same range for 2002 despite large differences in cow numbers, acres operated, hired labor and management style. The average grazier with a herd size of 48 cows obtained a similar household income to the average stored feed farmer with 108 cows.

Further evidence that graziers in Wisconsin and the Great Lakes region are performing as well as or better than stored feed dairy operations is presented in detail in *Pastures of plenty: Financial performance of Wisconsin grazing dairy farms.*[9] This study found that Wisconsin graziers had higher net farm incomes from operations per cow and per hundredweight equivalent of milk than both traditional and large modern confinement farms[10] every year from 1996 to 2002. In addition, *Pastures* co-author Tom Kriegl notes that a traditional small confinement farm with average management and a moderate debt load can improve financial performance with managed grazing. Switching to grazing does not require high cost investments and reduces equipment and machinery needs. Therefore, farmers can adopt grazing practices without suffering a financial setback during the transition. Despite these figures, 46 percent of producers responding to the WASS survey[11] cited farm profitability as a reason not to adopt grazing. Sixty-two percent of graziers responding to the same survey listed farm profitability as a reason to use managed grazing.

Debt

Graziers were more likely to be out of debt than stored feed operators, consistent with the lower capital investments necessary to set up a managed grazing farm business. In 2003, twenty-eight percent of mixed feed farmers and 27 percent of graziers said they had no farm debt, while 20 percent of stored feed operators reported being debt free. Most farmers had moderate farm debts between 10 and 40 percent of the value of farm assets, though more stored feed farmers than graziers carried this level of debt (see Fig. 5 on page 8).

[8] Total annual family income before taxes included the family share of net farm income plus income of household members from all other sources. Respondents had a choice of eight categories, each one being an income range.

[9] Kriegl, T. and R. McNair. 2005. *Pastures of plenty: Financial performance of Wisconsin grazing dairy farms*. UW-Madison CIAS.

[10] Kriegl defined traditional confinement dairies as having 50-75 cows, a stanchion barn, stored feed and mainly family labor and large modern confinement farms as having a parlor, free stalls, 250+ cows and dependent on hired labor and stored feed.

[11] WASS 2004 Dairy Producer Survey. December, 2004. Madison, WI.

Key Finding: The average grazier with a herd size of 48 cows obtained a roughly equivalent household income to the average stored feed farmer with 108 cows.

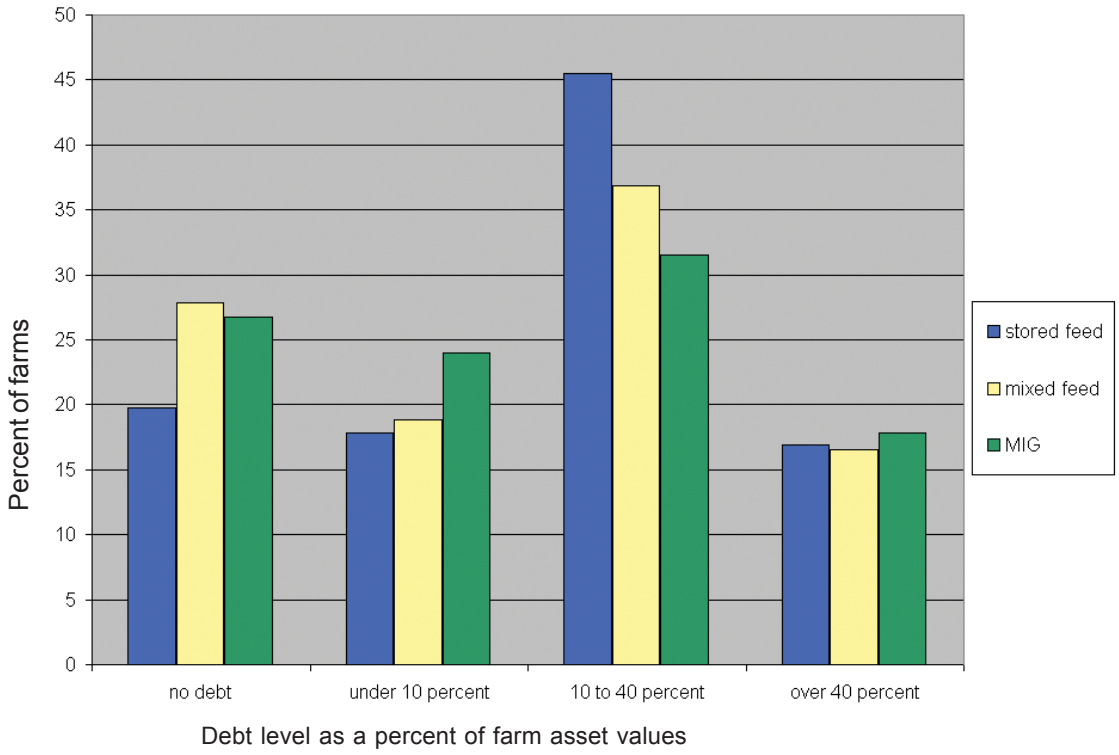
There were also more graziers with debt under 10 percent of asset values than either stored feed operators or mixed feed farms. According to Kriegl, managed grazing operations in Wisconsin have a better handle on costs, which may allow them to service debt more effectively than other types of dairy operations.

As a group, graziers were able to pay down their debts between the 1999 and 2003 surveys. There were fewer graziers with debts over 40 percent of asset values in 2003 (18%) than in 1999 (24%) or 1993 (33%). During the same time, the number of graziers with debt under 10 percent of asset values increased. The number of stored feed operators with the highest debt loads was lower in 2003 than in 1993. The same number of stored feed operations were debt free in 2003 as in 1993.

Seventeen percent of stored feed farmers and 18 percent of graziers had debts over 40 percent of asset values. This may reflect the long-term trend of tight margins for dairy farmers and suggests that entering farmers or those who are financially stressed may carry greater than desirable debt loads, regardless of management strategy.

In sum, managed grazing has the potential for profitability, with less debt and more productive assets (cattle and land) than other types of dairy farming. The graziers who are most successful pay attention to all financial parameters, including income generation, operating expense control and debt control, and they manage their farms carefully.[12]

Figure 5. 2003 Debt levels on Wisconsin dairy operations



[12] Kriegl and McNair, *Pastures of Plenty*.

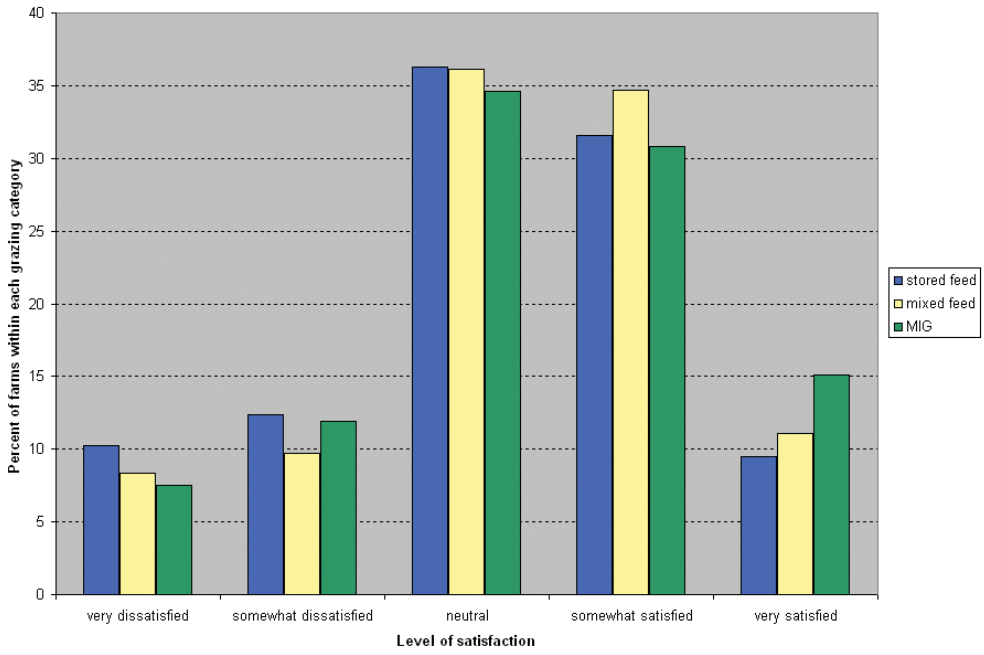
Satisfaction—Are graziers happy with their lifestyle?

As in past surveys, graziers were more satisfied with their lifestyle than other types of dairy farmers. Quality of life benefits have often been expressed at grazing conferences and pasture walks, although what factors contribute to this sentiment are now being explored in more detail by UW and CIAS researchers.[13] As of 2003, most of the dairy farmers surveyed were neutral towards or somewhat satisfied with their family's quality of life; however, satisfaction among all types of dairy farmers was down compared with past years. Without a specific definition, this subjective assessment can vary substantially for a variety of reasons, including market fluctuations, personal health, labor issues, finances and so on. In particular, the low milk prices of 2002 and 2000 may have contributed strongly to the dissatisfaction expressed by farmers in the 2003 survey.

Nonetheless, in 2003 graziers were less likely to be 'very dissatisfied' than stored feed farmers and more likely to be 'very satisfied' than other farmers (Fig. 6). Data for the most intensive of the managed graziers (those who moved their cows once a day or more) was looked at as well, since they often express strong satisfaction from their lifestyle. While too small a group to represent on the charts, the most intensive graziers were also the most likely to be 'very satisfied.'

These trends were also reflected in farmers' indications of how their quality of life had changed over the past five years. The bulk of respondents said their quality of life had remained the same, while 31 percent of the dairy farm families said it had gotten worse. This feeling seemed to sweep across all dairy farm categories, though management intensive graziers were less likely than others to rank their quality of life as dramatically worse (Fig. 7, page 10). Specifically, 83 percent of respondents said they were 'very dissatisfied' with the price received for milk

Figure 6. Overall family quality of life among Wisconsin dairy farmers, 2003



[13] Sarah Lloyd, research assistant, UW-Madison Rural Sociology department and CIAS.

Key Finding: Across all categories of dairy farmers, 41 percent of those polled said they will discontinue dairying in three years or less.

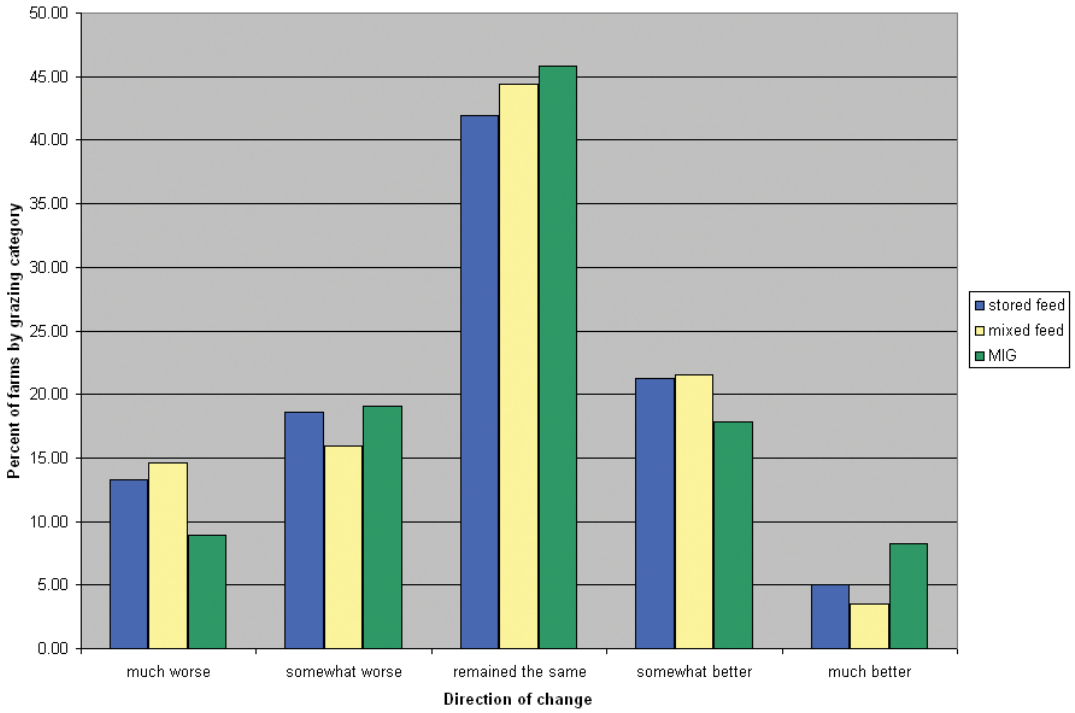
and 60 percent were 'very dissatisfied' with their net farm income.

In response to a new question posed in the 2003 survey, graziers were not more likely than other types of dairy farmers to take vacations of two or more days away from the farm enterprise, despite citing a better quality of life as one of the main benefits of using managed grazing. Anecdotally, they have said that grazing improves the quality of their farm work rather than the amount of time away from the farm. Dairy farmers who switched to grazing also said they had more flexibility in their work schedules; they could bring young children along while doing farm chores or get to family and community events.

When asked about future plans, about a third of dairy farmers expected to be farming for four to ten more years. Furthermore, 30 percent of graziers and 21 percent of stored feed farmers felt that they would continue farming 'indefinitely.' Since graziers are, on average, only about a year younger than their stored feed counterparts, perhaps more of them felt they could farm longer with a pasture-based system.

Across the board, however, **41 percent of farmers polled said they will discontinue dairying in three years or less**. While farm operators may have changed their minds since filling out the survey, if this figure is even close to accurate, dramatic changes are in store for Wisconsin's dairy industry.

Figure 7. Change in family quality of life over past five years, 1998-2003



What grazing looks like—Characteristics of farms and farmers

What does a typical Wisconsin grazing farm look like? Do graziers have land to grow row crops? How many cows do they have compared with other dairy farmers? We will continue to use PATS data from 1993 to 2003 to address these questions.

Farm size

On average, graziers and mixed feed farmers in this study managed farms that were similar in size, with farm size decreasing between 1993 and 2002 (Fig. 8). Graziers operated an average of 245 acres, including 133 acres of cropland in 2002. Many of them raised their own supplemental or winter feed.

Mixed feed farms operated about thirty more acres of cropland than graziers in 2002, for a total of 277 acres per farm.

In contrast to farm operations that used pasture, the stored feed farmers operated about 75 more acres in 2002 than in 1993, averaging 426 acres per farm. This included 336 acres of cropland per farm. Alfalfa and corn for grain accounted for two-thirds of the crops grown, by acreage, on all Wisconsin dairy farms.

Herd size

The average number of milk cows per Wisconsin dairy farm increased from 54 in 1993 to 82 in 2002. Stored feed operations accounted for most of the growth in herd size.

Graziers increased their herds from an average of 41 to 48 cows per farm over this decade (Figure 9). Mixed feed operations averaged 49 cows in 2002, the same as in 1993. During the same time, stored feed operations nearly doubled their average herd size,

Figure 8. Average number of acres operated per Wisconsin dairy farm

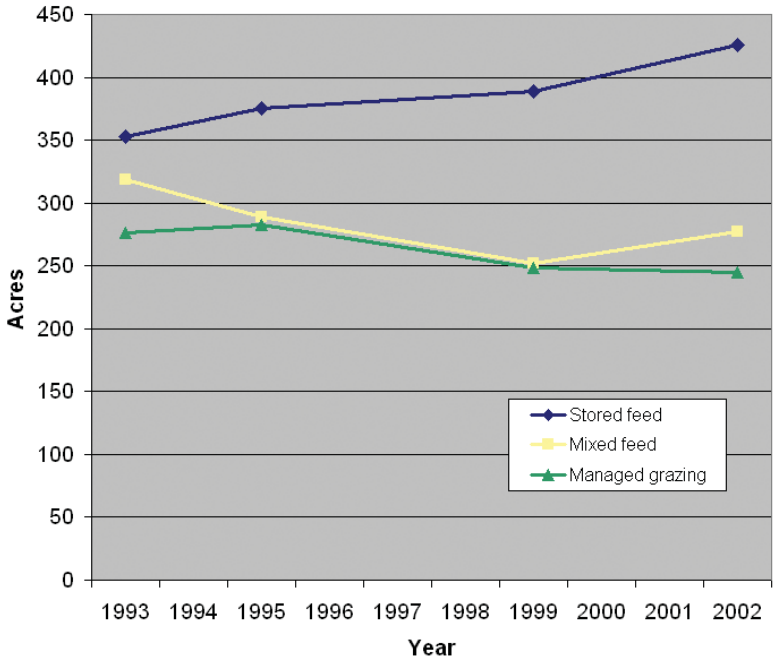
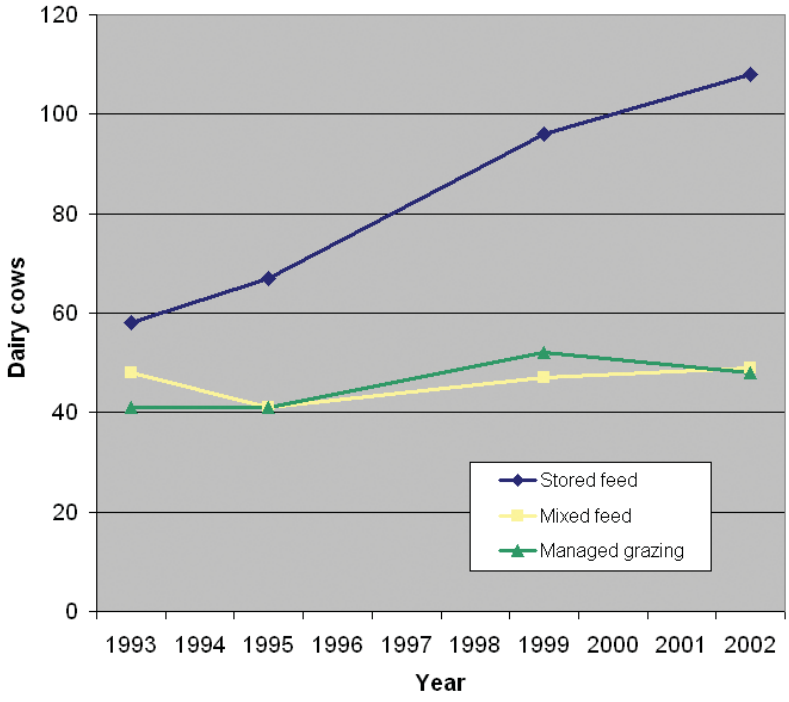


Figure 9. Average number of milk cows per Wisconsin dairy farm

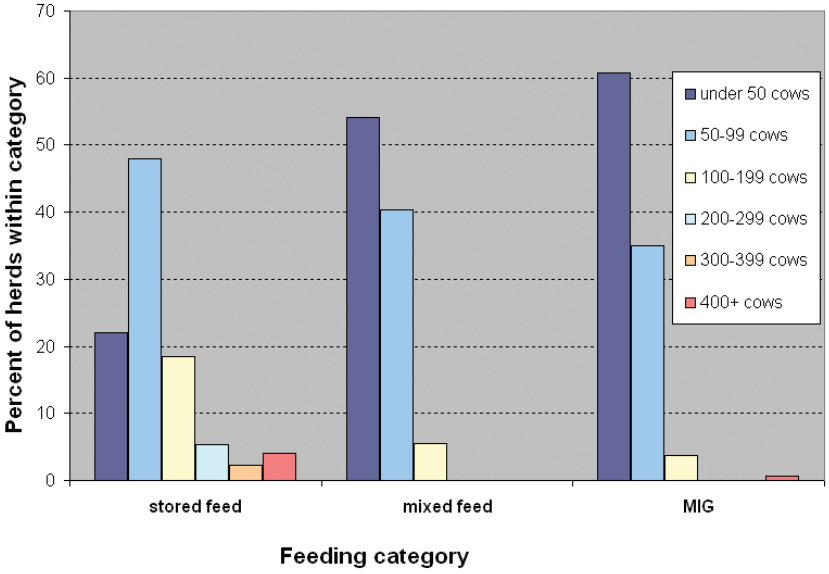


from 58 cows in 1993 to 108 cows in 2002. Much of this increase has come from more herds in the 50 to 200 cow categories and a reduced number of farms with fewer than 50 cows. Eighty-one percent of all dairy farms in Wisconsin had herds of fewer than 100 mature cows (milking and dry) in 2002, indicating that moderate-size farms remained the bulwark of the state's dairy production capacity.

In 2002, 54 percent of mixed feed farmers and 61 percent of graziers in Wisconsin maintained herds of fewer than 50 cows, down from 72 and 80 percent in 1995. Nearly half of stored feed farms had 50 to 99 cow herds, the same as in 1999 (Fig. 10). There were about 15 percent more graziers with 50 to 99 cows in 2002 than in 1995.

Only five percent of herds that used pasture for their milk cows in Wisconsin had 100 or more cows, and about 12 percent of stored feed farms had herds of 200 or more. One managed grazing herd of over 400 cows was part of the 2003 PATS survey, although it is known that there were additional graziers in this size category in the state. In New Zealand and elsewhere, grazing herds of roughly 150 to 300 cows are profitable single family operations, indicating that managed grazing can accommodate varying herd sizes. Wisconsin graziers give many reasons for maintaining relatively smaller herd sizes than their stored feed counterparts, including the number of acres of pasture utilized, labor decisions and profitability.

Figure 10. Herd size distribution among Wisconsin dairy operations, 2002



Operator characteristics—Who is using grazing?

Beyond the types of farms that they run, is there anything strikingly different about farmers who use managed grazing systems? The short answer is no. At first glance, Wisconsin graziers are of similar age, experience and farming background as other dairy farmers in the state.

Specifically, the average age of the primary operator of a Wisconsin dairy farm in 2003 was 48 years old. This was the same across grazing categories, with graziers as a group neither substantially older nor younger than other farmers. On average, graziers started farming at 23 years old, the same as mixed feed and stored feed farmers.

The lack of overall age differences indicates that no particular generation favored grazing. However, since the use of managed grazing has been promoted as an entry method for beginning farmers and for people with a non-farm background, we checked the distribution of age across grazing categories. Some slight differences showed up. The most common age category for stored feed farmers was 50 years old, 45 for mixed feed farmers and 40 for graziers. There were also relatively more graziers who were either 25 years old or 65 or more years old, whereas the number of stored feed farmers clustered more tightly around the average of 49. There were also minor differences in the years of experience of the

primary farm operators. Stored feed farmers had, on average, two and a half more years of experience than graziers, though there was a lot of variation within both categories. There were relatively more graziers with just five and ten years of experience than stored feed farmers.

Like the majority of Wisconsin farmers, graziers tended to come from farm backgrounds. Slightly fewer graziers grew up on farms (85%) than stored feed (91%) or mixed feed (90%) farm operators. Nearly two-thirds of all Wisconsin dairy farmers operated family land previously owned by their parents or their spouse's parents.

Overall, many Wisconsin graziers had traditional dairy backgrounds, but managed grazing has also been used as a start-up strategy by younger or less experienced farmers. Past reports on beginning dairy farmers indicated that 30 percent used managed grazing. The primary challenges for all entering dairy farmers, whether or not they had family farm backgrounds, were controlling debt, generating income and sticking it out through the difficult early years.[14]

Grazing management—How do graziers use labor and technology?

Graziers were likely to select farm management practices and technologies that made sense for their operations. For example, graziers kept production records on individual cows and used milking parlors at a frequency more similar to stored feed operators than mixed feed operators. In fact, when comparing farms of 25 to 99 cows, graziers were nearly as likely as stored feed operators to keep farm production records and use a milking parlor (Fig. 11).

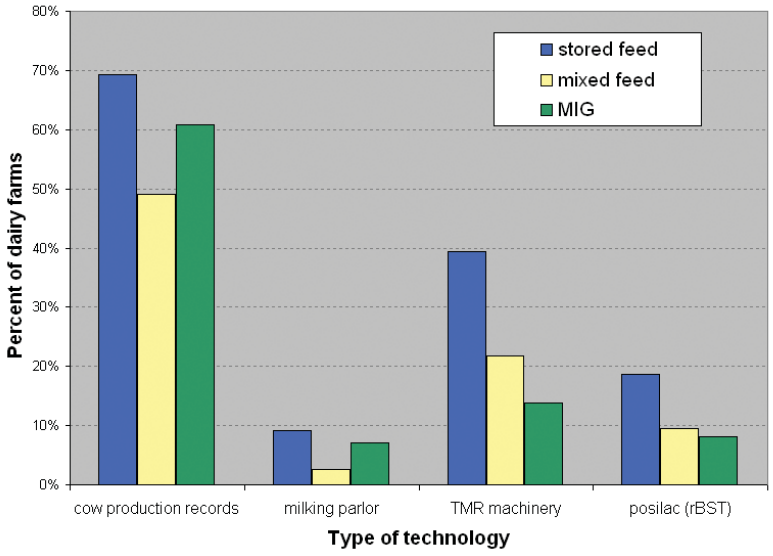
Milking parlors are particularly appealing to graziers who wish to maximize labor per cow or per hundredweight of milk. There are now plans and technical assistance available for low- and moderate-cost milking parlors.[15] In addition, grazing networks provide opportunities to tour the farms of graziers who have built low-cost parlors and obtain information about technology and management issues.

On the other hand, graziers were the least likely to use total mixed ration (TMR) machinery. This is consistent with their greater reliance on pasture and relatively smaller herd sizes.

Both graziers and mixed feed operators were less likely to use rBST than stored feed operators. Herd size is a likely factor in this decision and graziers often place less emphasis on maximizing milk production. In addition, rBST has been a controversial technology which some farmers have chosen not to adopt regardless of their production strategy.

Wisconsin dairy farms rely primarily on family labor. About nine percent of graziers hired additional year-round help, compared

Figure 11. Technology usage on Wisconsin dairy farms with 25-99 cows



[14] Barham, B., et al. 2001. *Nurturing the Next Generation of Wisconsin's Dairy Farmers. UW-Madison CIAS.* Frederick H. Buttel, et al. May 1999. *Entry into Wisconsin Dairying: Patterns, Processes and Policy Implications*. UW-Madison PATS.

[15] Dave Kammel, agricultural engineer, Center for Dairy Profitability.

with 18 percent of mixed feed farmers and a third of stored feed operators. Graziers and mixed feed farmers were somewhat more likely to work off farm than stored feed operators, though typically their wages only contributed three to seven percent more to household income than the off-farm wages of stored feed operators. Forty percent of spouses of all types of dairy farmers worked off-farm, with mixed feed operations using this strategy the most frequently. The top reasons given for off-farm work were to provide health insurance coverage, offset low milk prices and supplement farm income.

Production

Milk production averages reported by the survey respondents in 2002 ranged from about 20,700 pounds annually for stored feed operations to 18,200 pounds for mixed feed operations and 17,500 pounds for the managed grazing farms. These numbers are consistent with the expressed views of many graziers that they try to maintain a farm management system that works for them rather than maximize production. Over the years, PATS surveys have shown that graziers consistently produce less milk per cow than other types of farmers; however, their profit per cow is consistently higher. Many graziers have found that as their management skills improve, they can comfortably increase cow numbers, although production per cow may decrease when herd size exceeds 100 cows.[16]

Most graziers supplement fresh forage with grain and sometimes other feedstuffs to complement the nutrition obtained from pasture and provide additional return in milk above feed costs. As Kriegl noted, controlling costs and debt load, as well as optimizing income, has resulted in the best financial performance for graziers.[17]

[16] Kriegl and McNair, *Pastures of Plenty.*

[17] Ibid.

Implications

The steady long-term decline in farm numbers in Wisconsin has made the need to maintain or even increase the state's milk supply a priority for the dairy industry. Policymakers, lenders, communities and producers need to consider economically, socially and environmentally sound strategies for adding dairy farms. With lower capital investment, reduced machinery and labor requirements, good profitability and farmer support networks, managed grazing can be a successful model for entering dairy farmers as well as established farmers who switch from other systems. If the obstacles to grazing perceived by farmers are identified and addressed, then use of improved pastures may become a key part of the future success of the Wisconsin dairy industry.

Whether managed grazing expands as a whole farm management practice for 50- to 250-cow dairy farms will likely depend on the information farmers have available for decision making, as well as the actions of agricultural professionals and policymakers. In recent years, more information on grazing has been made available through published books, articles, magazines and newsletters.[18] Farmers wishing to start or transition to grazing can turn to educational and technical assistance resources such as the Wisconsin School for Beginning Dairy Farmers (WSBDF), GrassWorks and the Natural Resource Conservation Service (NRCS), as well as regional workshops and seminars held around the state. In addition, NRCS offers financial incentives for implementing grazing practices, as does the ongoing Grow Wisconsin Dairy Initiative.[19]

What's next for managed grazing in Wisconsin? We cannot give a conclusive answer, but we can ask relevant questions whose answers may determine what the scope and influence of grazing in the dairy industry will be in ten to twenty years. As beef, sheep, goat and other livestock enterprises continue to flourish in Wisconsin, the impacts of these pasture-based farms need to be assessed as well.

Will managed grazing expand to include more new dairy enterprises, started by people who see the

[18] Mariola, M., K. Stiles, and S. Lloyd. 2005. *The Social Implications of Management Intensive Rotational Grazing, An Annotated Bibliography.* UW-Madison CIAS.

[19] The WSBDF operates in conjunction with the UW-Madison Farm and Industry Short Course and can be reached at 608-588-2836, www.cias.wisc.edu/dairysch.html. To find out about GrassWorks and regional grazing networks, see www.grassworks.org. The NRCS grazing specialists can be accessed at www.wi.nrcs.usda.gov/programs/grazing.html. For the Grow Wisconsin Dairy program, see www.growwisconsindairy.org

lifestyle and profitability as reasons to enter farming? With grazing networks and supplies widely available, one of the most significant hurdles faced by people wanting to start seems to be finding a farm. Retiring farmers are often unwilling to relinquish management control or move off the farm. Development pressure and rising land prices are also obstacles to new farm families trying to rent or purchase a farm.

What are the specific hurdles that keep dairy farmers discouraged by economic issues such as low milk prices and rising energy costs from transitioning to grazing? As WASS found in their 2004 Dairy Producer Survey, farm profitability, putting in fences or watering systems, and changing their farm management were the most frequently cited reasons not to adopt grazing. Interestingly, profitability was cited by 62 percent of graziers as a reason for using managed grazing.

What are the issues that influence producers, lenders, agribusiness professionals and policy makers as they consider whether managed grazing can make a strong positive impact on the state? They might include: having enough research data about grazing that is easily read and interpreted; determining the effects of different production practices on the farmer, the dairy industry, the environment and society; and looking at whether the push for the next generation of farmers to get bigger makes sense when 'economies of scale' have yet to materialize across the board for large dairy enterprises.

As groups outside of agriculture wrestle with issues of land use, the environmental and ecological impacts of industrial activities including farming, and the pressures of population, energy costs and labor issues, it is evident that decisions about farming will not just be made by the farming community. For the dairy industry, in particular, determining the impacts of managed grazing on rural communities, the environment, and the ability of agriculture to attract new producers, processors and markets will be useful to the kinds of planning and strategy sessions that will shape the picture of Wisconsin farming in the years to come.

Appendix A

Explanation of the PATS data and survey

The 2003 Wisconsin Dairy Farm Poll was conducted by the Program on Agricultural Technology Studies (PATS) at the University of Wisconsin-Madison. Surveys were mailed to 1,694 randomly selected Wisconsin dairy farms using the statewide list of dairy farm operations maintained by the Wisconsin Department of Agriculture, Trade and Consumer Protection. Forty-five percent (762) were completed by active dairy farmers, i.e., those milking cows on their farm in 2002. Only data from surveys completed by the primary farm operator (724) were included.

Statistical significance testing was performed on the 2003 survey data, but is not presented in this report largely because there were more similarities between operations than differences.

Similar large-scale random sample surveys of Wisconsin farmers were conducted by PATS in 1999, 1997, 1995 and 1993. Additional results from these surveys, as well as details about survey methodology and analysis can be obtained directly from PATS (for contact information, see inside front cover).