METHODS OF CHANGE AND FINANCIAL PERFORMANCE OF DAIRY FARMS BEFORE AND AFTER A SWITCH TO MANAGEMENT INTENSIVE GRAZING

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ABSTRACT

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Interest in Management Intensive Grazing (MIG) of dairy cattle has increased during the last 2 decades. Most dairy producers utilizing MIG were former confinement or non-intensive pasture operations while the others started their operation with MIG. While research publications tout the financial and other benefits of MIG, often comparing them to non-MIG dairies, and anecdotal evidence in popular farm press has shown MIG in a favorable light, comparing a MIG dairy farm to itself before and after the management switch has not been a subject of research scrutiny. Knowing the potential impact of a switch to MIG prior to making a management decision to do so would be a significant piece of information for a dairy farm to understand if contemplating such a management change. Which farms are candidates for success following a switch? What changes in labor, cost of production, and herd health might be expected? These and other questions were investigated by examining 29 MIG dairy farms in Michigan. These farms experienced similar milk production levels per cow, reduced feed and hired labor cost significantly, reduced the acres of row crops grown, and experienced improved herd health resulting in much lower herd health costs. They did not build farm acres, but rather grew cattle numbers and improved management of pasture forage. Research work remains to be done that will more accurately measure true economic progress and further find management techniques that prove successful for MIG farms.

DEDICATION

To mom and dad,

for the life lessons and continual support on this project,

as well as the important, and the not-so-important things of life.

No matter where I've gone or what I've done,

your support and encouragement never waivered.

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Chapter 1. Introduction

Dairy farms face financial, social, environmental, and regulatory challenges that threaten the sustainability of farm businesses, most of which are family owned and operated, that have existed for decades or even centuries. These challenges often present the dairy farm with an opportunity for change or precipitate the necessity for change. This change in the business could be a change in size, a vertical integration or an addition to product value. One management change employed on dairy farms is a switch to Management Intensive Grazing (MIG) from conventional year-round confinement management or non-intensive pasture management. MIG is also referred to as intensive grazing, rotational grazing, or management intensive rotational grazing (MIRG) (Nott 2003). In more recent years, planned grazing is another synonym. For some dairy producers, the switch to a MIG system has shown to provide benefits in regards to improved life-style, economic success, and neighbor relations. The USDA NRCS (Aschmann and Cropper, 2007) suggests that one advantage to a pasture-based system is its reduced start-up costs, making it attractive to young farmers interested in dairy farming. Do these management changes – grown out of opportunity or necessity – result in positive economic results for the dairy farm? To what measures of success do MIG dairy producers aspire? What are the most important management skills dairy producers need to master in order to succeed using MIG? Are there guidelines that other farms can use that have been shown to be beneficial steps in making a major management change to MIG?

Management Intensive Grazing is certainly not a new concept. Its virtues were touted even before the greater movement toward it in the late 1980's and early 1990's. In

his book, Modern Dairy Cattle Management, Richard Davis (1962) described intensive grazing as a procedure devised to “eliminate this waste by more intensive grazing”. The “waste” he was describing was the forage lost due to trampling and selective foraging on continuous pasture systems. Intensive grazing, according to Davis, “provides fresh rapidly growing feed over a longer period” than does continuous grazing. And while in recent years, pasture experts have recommended the inclusion of summer annuals in the grazing forage mix, Davis recommended them in his book written nearly 50 years ago.

The purpose of this research was to compare the financial situation of dairy farms before and after conversion to MIG from confinement or non-intensive grazing. In addition, the reasons that precipitated the switch were investigated to determine what circumstances led the dairy to make a switch to MIG as well as what steps or process the farm used in making the change. This data then could lead to guidelines that could be used by dairy producers to help them make a decision about converting to MIG. Finally this project aimed to determine whether or not MIG dairy farms are returning a satisfactory standard of living for the farm family compared to the situation prior to converting to MIG.

Nott (2003) postulated that “somewhere between 8 and 22 percent of the dairy farmers in the Great Lakes States used MIG” and that these farms produced less than the same percentage of milk due to generally smaller than average herd sizes and less productive cows. The growth in popularity of MIG dairy farms is well documented by Ostrom and Jackson-Smith (2000) in Wisconsin where the estimated number of MIG dairies more than doubled from 1993 to 1999 while the change of non-intensive grazing operations and confinement operations was -46.5% and -36.4% respectively during the

same period (Table 1.1). These findings appear to indicate a significant transition to MIG by Wisconsin dairy producers. The change was significant with respect to herd numbers, but not so for cow numbers and total milk production. Kriegl and McNair (2005) reported the average size of MIG herds in 2001 was 62 cows in Wisconsin and Kriegl (2007) reported 84 cows were in the average Great Lakes Region MIG herds the same year. The National Agricultural Statistics Service – NASS (2007) reported a 19.2% reduction in the number of operations with 50 to 99 cows in Wisconsin from 1993 to

Table 1.1 Wisconsin Dairy Farms By Grazing Management[1]				
	Management Intensive Grazing Operations	**Non-Intensive Grazing Operations**	**Confinement Operations**	**All Dairy Farms**
1993 Wisconsin Farm Survey				
Number of respondents	**38**	**155**	**331**	**524**
(Percent of Sample)	**7.3%**	**29.6%**	**63.2%**	**100%**
Estimated size of population[2]	**2,191**	**8,939**	**19,088**	**30,218**
1999 Wisconsin Farm Survey				
Number of respondents	**171**	**173**	**440**	**804**
(Percent of Sample)	**21.8%**	**22.1%**	**56.1%**	**100%**
Estimated size of population	**4,714**	**4,779**	**12,131**	**21,624**
Percent Change in the Population				
1993 – 1999	**115.1%**	**- 46.5%**	**- 36.4%**	**-28.4 %**

1. Subgroups will not add up to total since grazing management information was missing on a small number of cases.

2. Population estimates obtained by multiplying the percent of the sample in each subcategory by the total number of dairy farms licensed in the state on March 1st of the year of the survey.

1999. Dairy farms of smaller size than the average MIG herd experienced higher reductions as the number of farms with 1 to 29 cows and 30 to 49 cows dropped 40.3% and 34.3% respectively. On the other hand, farms with 200 or more cows grew in number by 133% from 1993 to 1999. It is reasonable to conclude that the reductions of

non-intensive grazing and confinement operations on which Ostrom and Jackson-Smith reported, were for the most part, small farms of less than 100 cows. These same NASS statistics report that the percentage of total milk produced in Wisconsin from herds with 200 or more cows was 5.7% in 1993. In 1999 the share had increased to 19%. Conversely, herds with less than 50 cows accounted for 30.8% of the state's milk production in 1993 and fell to 22% in 1999. Combining all herds with less than 100 cows the statistics are similar as these farms accounted for 74.8% of the milk production in 1993 and 61% in 1999. Therefore, while the increase in number of herds utilizing MIG in Wisconsin during the 1990's is encouraging for grazing enthusiasts, it does not indicate a significant swing toward grazing as capturing more market share of milk production in Wisconsin. This transition to grazing by these small dairy producers may better indicate that small farms could, and some indeed have found, that MIG improves sustainability of these smaller size dairy farms.

Taylor and Foltz (2006) surveyed dairy farms and found that 44% of Wisconsin dairy farms fed pasture to milking cows even though grazing was not always managed intensively. Merrill (2006) found barriers to switching to MIG by conventional dairy producers were debt load, land availability, fear of a loss in milk production, MIG practicality, and a MIG fit with established lifestyle. Merrill (2006) also found barriers to MIG among beginning farmers were land availability, capital, and experience.

Previous studies have been conducted to determine the financial performance of grazing dairy farms. These studies have gathered data, compared the performance of MIG herds to other graziers and confinement herds, and compared grazing herds in one location to grazing herds in other locations.

Few research studies have tracked the progress of grazing dairy farms prior to and after a switch to MIG. There are no detailed guidelines for determining when and how to make a switch to MIG. Using guidelines could help potential MIG dairies – both existing and startup – avoid the pitfalls and foibles that could retard the financial growth and strength of the dairy farm business.

The results of this summary of case studies project may be used by dairy producers to make educated decisions about changing their management strategy to MIG. The information gathered and summarized will be useful in projecting where similarly positioned dairy farms can expect to be in the future after making a management change to MIG. Similarly, researchers working with grazing dairy farms will utilize this information to make estimates or judgments about other research subjects. Finally, dairy industry professionals, particularly lending institutions, can utilize the data to make estimates about a prospective client's financial situation when considering MIG strategies for their dairy clientele. Few research studies have looked intensively at the reasons, financial and social, for why dairy producers choose to make a switch to MIG. Those studies that have, did not examine the financial results to see if the reasons for switching truly "paid off."

Chapter 2. Literature Review

Mariola, Stiles, and Lloyd (2005) provided an excellent synopsis of research on MIG in their annotated bibliography of The Social Implications of Management Intensive Rotational Grazing. Their work categorized 134 research projects, papers, and special reports in four sections: Economic Studies, Sociological Studies, General Reports on Grazing, and Secondary Issues. In addition, they posed recommendations for future directions of sociological research on grazing, saying that "participatory research should be engaged to ensure relevance for graziers, communities, and policy makers." They recommended this future research include on-farm and off-farm components. Their recommendations for future research included topics examined at least in part in this research project. They included:

* Factors influencing the decision to graze and barriers to switching.

(Proposition #4 page 59)

* Labor requirements and the division of labor in rotational grazing.

(Proposition #5 page 64)

* Linking rotational grazing to family success and quality of life.

Within the 66 economic studies of MIRG commented on in their paper, 37 of them examined an economic comparison between grazing and non-grazing farms. Only two of the studies did not involve dairy farms.

1. Comparing Grazing to Confinement

Several studies (Kriegl and Frank 2004; Gloy, Tauer, and Knoblauch 2002; Dartt, Lloyd, Radke, Black, and Kaneene 1999; and White, Benson, Washburn, and Green 2002)

have compared the financial performance of grazing herds with conventional or confinement herds. Most concluded that grazing systems are financially competitive to confinement systems, especially with similarly sized herds. Kriegl and Frank (2004) examined dairy farms in Wisconsin managed under three types of systems: management intensive rotational grazing (MIRG), traditional confinement (TC), and large modern confinement (LMC). Their work summarized eight years of data from 1995 through 2002. Kriegl and Frank used Net Farm Income from Operations (NFIFO) per Hundredweight Equivalent of Milk Sold (CWT EQ) to compare the groups. They utilized the equation for NFIFO from the Farm Financial Standards Task Force where:

NFIFO = Income from Operations – Expenses and Costs of Operation.

Income from operations includes the cash income as well as the non-cash sources of farm income such as the positive changes in crop inventories, raised breeding livestock, and other current assets used in the operation. Expenses and costs of operations include the cash and non-cash expenses associated with farm production. The non-cash portion includes changes in prepaid expenses and accounts payable, and depreciation on livestock, machinery, and buildings.

NFIFO does not include interest income nor income (or loss) from the sale of farm assets. It is a good measure of performance when comparing the same farm from year to year. Care should be exercised in making comparisons between farms using NFIFO as large differences in debt structure – and therefore interest cost – as well as labor supplied by unpaid sources can provide large differences in financial performance

between dissimilar farms. Comparing groups of farms may dilute the effect. However, if these same groups tend to be heavily leveraged (expanding farms) or utilize mostly unpaid labor (grazing farms) the comparison runs a risk of inaccurately comparing vastly different farms.

The other portion of the economic variable is hundredweight equivalent of milk sold, a measure of the total farm income expressed on a hundredweight basis where:

CWT EQ = Total Farm Income / U.S. All Milk Price per Hundredweight

Kriegl and Frank (2004) found that MIRG farms were able to generate a higher NFIFO/CWT EQ than either of the other two groups in every year of data collection. Even when all labor costs were excluded from the cost data, the MIRG farms were higher when calculated per CWT EQ. Due to the larger size of the herds and the higher per cow production level, the LMC farms had the highest total NFIFO, sometimes by a four-fold margin over the grazing dairy farms. Their conclusions suggest that MIRG dairies were lower cost producers than either of the other groups and the large modern confinement dairies had the lowest NFIFO/CWT EQ in all years and were the high cost producers. This work examined only NFIFO/CWT EQ and did not report cash flow or net worth changes as measures of economic performance.

Dartt, et al (1999) conducted a retrospective cohort study of Michigan dairy farms, 35 of which were grazing and 18 were conventionally managed dairies. Dairy farms were matched by size and geographic location and financial data from 1994 was used to compare the herds. The study measured performance via three economic efficiency

indicators: capital efficiency (asset turnover (ATO)), operating efficiency (net farm income %, NFI%), and labor efficiency (value of farm production per labor hour, VFP). Findings of their work suggest that milk production per cow was very similar between grazing (13,992 lbs/cow) and conventionally (15,090 lbs/cow) managed herds and also was not significantly different than the average production per cow in the state (16,905) (NASS 2007). The study concluded through univariate analysis that little difference was found between MIG and conventionally managed farms. Through multivariate regression analysis, "MIG farms tended to have higher economic profit and higher capital efficiency and were significantly more operating and labor efficient." The authors recognized that the locations of the farms in this study did not represent the "dairy belt" of Michigan and extrapolation of results to this region would be unsubstantiated. They did conclude that MIG could provide a sustainable alternative for dairy farms in portions of Michigan. Based on the inability to locate grazing farms in the dairy belt of Michigan, future work should be performed to find grazing farms in locations where dairy farms are very competitive with high milk per cow production averages and more highly productive soils for forage and grain production. In addition, their work was limited to one year's financial data, whereas multiple year data would better demonstrate trends.

Tozer, Bargo and Muller (2003) used a partial budget approach to compare net incomes of "high-yielding Holstein cows fed either a total mixed ration (TMR), a pasture-based diet, or a combination of both." They cited several research studies that used case studies, surveys, or accounting analysis to compare grazing to conventional management, but suggested that few have been based on scientific experiment that would analyze production responses under various systems. They used forty-five Holstein cows

that averaged 1,378 lbs (624 kg) body weight, 98.8 lbs (44.9 kg) of milk per day and were an average of 109 days in milk (DIM). The cows were started on a 21-day trial in May 2000. Cows were stratified in groups of three by lactation number and DIM and were then assigned randomly to three dietary treatments: pasture plus concentrate (PC), pasture plus TMR (partial TMR or pTMR) and TMR (no pasture). Bargo (2002) reported the performance results in a separate paper. Cows on the PC treatment consumed 19% less total ration dry matter and produced 26.5% less 3.5% fat corrected milk (FCM) per cow per day than the cows on the TMR system. The pTMR group was intermediate of the PC and TMR groups. In other work, Kolver and Muller (1998) concluded that traditional TMR feeding systems generated the highest level of income over costs when compared to the other systems in most cases. Tozer, Bargo, and Muller (2003) did however suggest that their project only compared the groups of cows during a short period of the grazing season and that longer term analysis would improve the comparison. In addition, this study only examined the difference in feed cost, the highest cash expense for dairy farms. It should be noted also that they began the project with high producing cows (98.8 lbs per cow per day) and did not utilize cows with a lower level of milk production. It may be that farms struggling to achieve or not desiring to have high milk per cow production averages will find greater success with MIG as production level changes would be minimal while cost could be greatly reduced.

White, Benson, Washburn, and Green (2002) found that feed costs were $0.95 per day lower for pastured cows than confinement fed cows. Their four-year project compared two breeds (Holstein and Jersey) on two management systems (pasture and confinement) and two seasons of calving (fall and spring). The study concluded that

although milk production was lower for pasture based systems, lower feed costs, lower culling costs, and other economic factors indicate that pasture-based systems can be competitive with confinement systems, and that there was no significant difference for income over feed costs between the confinement fed and pasture fed cows.

Gloy, Tauer, and Knoblauch (2002) compared the profitability of New York dairy farms that utilized grazing or mechanical harvesting of forages. Their results – based on analysis of Return on Assets (ROA) - were that numerically, grazing dairy farms had lower ROA than non-grazing farms. However, regression analysis that controlled for factors affecting profitability revealed that the returns generated from grazing dairy farms were at least as great as those from non-grazing farms. They suggest that much of the difference in ROA between grazing and non-grazing farms could be attributed to "location, rates of milk production, milk receipts, and herd size". Gloy concludes by saying that some farmers utilize MIG for reasons other than financial and may indeed "pay an income penalty for adopting grazing." Their results do not indicate that this is necessarily so and farms that make a transition to grazing for primary reasons other than financial, do not automatically give up income or profit potential.

While many of these and other research projects have compared grazing dairy farms to non-grazing dairy farms, we found none that have compared grazing farms to themselves prior to becoming a MIG dairy operation and following the switch to grazing. This study looks to compare the financial position of MIG dairy farms before and after they made the switch to management intensive grazing.

In conclusion, some research results find grazing dairy farms performed better financially than similarly sized farms under non-grazing management. Depending on

how one wishes to measure success or make comparisons, grazing or confinement systems can be made to look more favorable than the other. Dairy producers must understand that while comparisons to other dairy farms can be helpful, they must be able to maintain profitability over the long term and meet the goals they have established for their farm. Their farm may not compare favorably with other dairy operations, but may still adequately meet the financial and social needs of their farm family.

2. Financial Performance Summaries

Michigan State University Extension has conducted financial data gathering and summarization through the TelFarm Center for farm financial record keeping. TelFarm members provide detailed financial data through the TelFarm for Windows Accounting software and related software including payroll, check-writing and depreciation. Extension educators at the District and County levels help gather balance sheet data and provide clients with a business analysis using the FINPACK software program from the Center for Farm Financial Management at the University of Minnesota (www.cffm.umn.edu). The Michigan business analysis summaries for dairy producers (Wittenberg and Wolf 2006) have been available since 1996 and summaries for grazing dairy farms have been provided since 1998. The 2002-2005 summaries authored by Wittenberg and Wolf are available at the MSU Extension Farm Information Resources Management (FIRM) team website at http://web1.msue.msu.edu/firm/telfarmreports.html. Summaries from 1996 to 2001, authored by Sherrill Nott (2002) are available at www.msu.edu/user/nott/ . The process of gathering data and maintaining accurate records for farms has provided substantial teaching opportunities for MSU Extension as

well as providing a data base of farm financial records for research and publication purposes such as establishing crop and livestock production budgets. These summaries help dairy producers compare their farms to an industry standard or average. The summaries provide a comparison of the data based on the top and bottom 25% of the whole data set as well as information grouped by farm size (based on number of cows). Table 2.1 shows a history of farms included in the dairy business analysis summary for 1996 – 2005 and the accompanying dairy grazing business analysis summaries.

Table 2.1 Dairy Farm Business Analysis Summaries for Michigan 1996 – 2005.

	Numbers of herds and average number of cows per herd.			
	All Dairy Farms		Grazing Dairy Farms	
	Number of farms	Ave. Number of Cows	Number of farms	Ave. Number of Cows
1996	146	158	NA	NA
1997	132	185	NA	NA
1998	154	194	15	98
1999	153	183	12	94
2000	150	203	NA	NA
2001	158	188	14	99
2002	150	206	9	111
2003	141	196	9	114
2004	144	199	10	115
2005	156	194	11	115

The information collected for the Michigan Dairy Farm Business Analysis summary for Grazing Dairy Farms was included in a larger collection of dairy grazing financial records for the Great Lakes Grazing Network's reports from 2000 – 2005 authored by Kriegl (2007). These reports are available from the Center for Dairy Profitability at the University of Wisconsin online at http://cdp.wisc.edu/. Financial information gathered from MIG dairy farms in the great lakes region and Canada was summarized using the Agricultural Financial Advisor (AgFA) software. The latest report

(Kriegl, 2007) included data in various tables and charts and includes descriptive case studies. Report items of significance include the comparisons of herd size, breed, seasonal vs. non-seasonal calving, and the top half vs. bottom half of producers sorted by Net Farm Income from Operations (NFIFO) per hundredweight equivalent (CWT EQ). Some conclusions of the report include:

- In all six years of the study, the average NFIFO per CWT EQ of the smaller herds (less than 100 cows) was greater than the larger (100 cows or more) herds.
- A review of breed differences indicated no clear advantage between Holstein and non-Holstein grazing dairies. In the first three years compared, Holstein herds averaged a higher NFIFO per CWT EQ than the non-Holstein herds, however the non-Holstein herds were slightly higher in 2004 and virtually equal in 2005.
- Seasonal calving graziers represented no more than 15% of study participants in any one year. Seasonal herds experienced more volatility in NFIFO per cow across six years of the study. In the years when seasonal herds had an advantage in NFIFO per cow, the milk price pattern was ideal for spring seasonal calving farms (high milk price in spring and early summer compared to the rest of the year).
- The top and bottom halves of the study participants were sorted by NFIFO per CWT EQ. The average top half of the herds were smaller (average 20% smaller over six years), produced slightly more milk per cow (averaged 84 lbs more per cow per year over six years), and had lower total costs per CWT EQ.

The last comparison between the top and bottom halves, requires further investigation and should be impetus for future research. Finding the management strategies, understanding the on-farm circumstances, and other differences in these two groups could be very beneficial to current and future MIG dairy operation success.

A third series of dairy farm business analysis summaries is the New York Dairy Farm Business Summary (DFBS) for Intensive Grazing Farms. The 2005 summary (Conneman, et al 2006) marked the 10th anniversary of the work done by Cornell University. The DFBS is available through the Cornell Extension web site at www.aem.cornell.edu/outreach/materials.htm. As in the other summaries, the New York report includes financial data from grazing farms. However, the Cornell summary also collects data on grazing management such as supplemental feeding systems, rotation frequency, water source, and milking system. For example, the 2005 summary indicates on page 6 that supplementation with corn silage has proven profitable in some years and not profitable in others. In 2005, supplementation of corn silage by 16 farms reporting detailed feed records resulted in improved labor and management income per operator per cow, increased milk sold per cow, and was accompanied by increased grain feeding compared to 10 farms that did not feed corn silage. This additional data allows the New York summary to compare management techniques with the resulting financial performance. The NY DFBS also collects data for non-grazing farms and compares to the grazing farms. On page 10 of the 2005 report a comparison is made between all grazing farms, all non-grazing farms, the average of the top 30% of grazing farms – determined by Labor and Management Incomes Per Operator Per Cow - and profitable non-grazing farms – defined as non-grazing farms with similar herd size as the top 30%

of grazing farms with labor and Management Incomes Per Operator greater than $23,000. This comparison is unique in that it compares the better grazing farms to the better non-grazing farms with similar herd sizes. A portion of the page 10 table is reproduced in Table 2.2. This table provides an interesting comparison of grazing versus non-grazing

Table 2.2 Intensive Grazing Farms vs. Non-Grazing Farms in New York, 2005.

Item	All Intensive Grazing Farms[1]	Non-Grazing Farms[2]	Average Top 30% Grazing Farms[3]	Profitable Non-Grazing Farms[4]
Number of farms	42	69	13	25
Number of cows	95	94	115	113
Net Farm Income (with appreciation)	$ 80,766	$ 79,634	$ 119,660	$ 147,430
Net Farm Income (without appreciation)	$ 54,103	$ 51,209	$ 83,594	$ 105,188
NFI per cow w/o appreciation	$ 572	$ 543	$ 730	$ 935
NFI per cwt. w/o appreciation	$ 3.41	$ 2.75	$ 4.51	$ 4.36
Labor & Mgt. Income/operator	$ 17,801	$ 5,967	$ 46,429	$ 43,197
Labor & Mgt. Income/operator/cow	$ 187	$ 63	$ 404	$ 384
ROR on Equity capital with appreciation	7.0%	4.8%	15.8%	13.2%
ROR on all capital with appreciation	6.6%	5.0%	12.1%	11.4%

1. Farms grazing at least three months of the year, changing paddock at least every three days, forage from pasture at least 30 percent, and no organic farms.
2. Farms with similar herd size as the 42 intensive grazing farms.
3. Top 30 percent of grazing farms by Labor and Management Income Per Operator Per Cow.
4. Farms with similar herd size as the "Top 30%" grazing farms plus labor and management incomes per operator were greater than $23,000.
NFI = Net Farm Income, ROR = Rate of Return

farms that is often not reported in research or summaries that compare simple averages of farms. It is evident that the gap in economic performance measures between intensive grazing farms and non-grazing farms narrows when comparing the more profitable groups of farms to one another. For example, all intensive grazing farms have a labor

and management income per operator that is nearly three times the level of non-grazing farms. However, the top 30% of grazing farms and the profitable non-grazing farms of similar size are nearly equal. This makes a point that highly profitable confinement (non-grazing) farms may be less likely to switch to MIG for financial reasons. Conversely, low profit non-grazing farms may be good candidates for a switch to MIG to improve financial performance.

The three financial performance summaries referenced verify a difficulty when examining farm financial data. Each summary uses a different main variable for ranking or classifying the farms in the summary. One uses NFIFO per CWT EQ, another uses Net Farm Income, still another uses Rate of Return on Assets. While combining the preferences of different institutions and their researchers will be difficult, dialogue and efforts to do so should continue to the benefit of the dairy farm community. In the interim, dairy producers, industry representatives, and educators must recognize these differences and consider their impact on farm performance and future recommendations for implementing management changes.

3. Lifestyle and Management Style Evaluations

Other research has focused on the lifestyle or management characteristics and preferences of dairy farms that have switched to or utilize MIG. Parsons, Luloff, and Hanson (2004) surveyed more than 2,000 dairy farms in Pennsylvania, Vermont, Virginia, and North Carolina. Their goal was to identify using survey data "the farmer characteristics, farmer attitudes, farm size and farm location characteristics associated with the adoption of intensive grazing." Little evidence was found to differentiate the

intensive grazing farms from the non-intensive grazing farms or the confinement farms. The level of satisfaction gained from various production practices and lifestyle characteristics of the farms were similar. Winsten, Parsons, and Hanson (2000) asked 1,008 dairy graziers to report their level of satisfaction with eleven various farm aspects. They were asked to score each aspect on a scale of one (very dissatisfied) to five (very satisfied). Farms in their study were categorized as continuous, traditional, moderately intensive or intensive grazers. Non-grazers were not included in the study. These categorizations were made based on responses to the study survey pertaining to rotation frequency, percent of forage supplied by pasture and how rations were adjusted when cows were on pasture. With the exception of milk production per cow, the intensive grazing group reported the highest average satisfaction level on every aspect. Table 2.3 displays the statistically significant differences they found between the intensive grazing

Table 2.3 Statistically significant difference (P< 0.05) between Intensive (n=85) and other grazing farm categories.

	Continuous (n=492)	**Traditional (n=194)**	**Moderately Intensive (n=237)**
Milk Production per cow	No	No	No
Herd Health	No	No	No
Purchased feed costs	Yes	Yes	Yes
Hired labor costs	No	Yes	No
Operator labor requirements	No	Yes	No
Capital replacement costs	No	Yes	Yes
Machinery repair expense	Yes	Yes	Yes
Time away from farm	No	No	Yes
Anxiety/stress level	Yes	Yes	Yes
Profit level in 1996	No	Yes	Yes
Financial progress (1990 to 1996)	Yes	Yes	Yes

Source: Winsten, Parsons, and Hanson (2000)

farms and the other grazing farm categories. A “yes” indicates a significant difference in how the farm groups rated their satisfaction. Farms with no grazing rotation (continuous

grazing) were more comparable to the intensive grazing group than the groups that did rotate pasture. Regardless of level of grazing intensity, satisfaction with milk production per cow and herd health was rated similarly.

Lloyd, Bell, Kriegl, and Stevenson (2007) assessed life satisfaction on Wisconsin dairy farms and differentiated survey responders into four groups: non-intensive pasture, managed grazing, small confinement, and large confinement. They investigated the different attitudes toward life satisfaction as they related to qualities of having, (the acquisition of possessions or social status) being, (the full realization of one's potential) and serving (the satisfaction from contributing to others' well-being). They concluded that farmers from different dairy farm systems experience quality of life and life satisfaction differently, as do men and women on these farms. They found that managed graziers and operators of large confinement farms reported the highest quality of life or life satisfaction on several measures. Lloyd emphasized the need of dairy producers considering a change in management style to consider life satisfaction goals in their decision-making process.

It appears reasonable to conclude that farms using MIG are as satisfied or are more satisfied with their life style than non-intensive grazing farms or non-grazing farms. Therefore, dairy farmers contemplating a switch to MIG would likely realize a life-style as satisfying or more satisfying than they currently experience.

Chapter 3. Methods and Procedures

Finding dairy farms in Michigan that utilize MIG began with acquiring the list of licensed dairy farms in the state from the Michigan Department of Agriculture (MDA). This list was cross-referenced with two mailing lists maintained by Michigan State University Extension (MSUE) staff. The first was a listing of participants in past grazing conferences held in Michigan maintained by the MSUE Forage Team. The other list was maintained by former Jackson County Extension Agent, Bill Bivens. Mr. Bivens helped coordinate several Great Lakes Dairy Grazing Conferences, represented MSUE on the Great Lakes Grazing Network, and provided dairy grazing expertise for dairy farmers in the state as part of his Extension programming. In addition, farms were located through local county Extension Educators working with dairy and forage management. Participants that fit the model for this project were characterized as farms that:

1) Switched from confinement or non-intensive grazing to MIG in the past 15 to 20 years prior to 2005.
2) Were not bottling or retailing or direct marketing from the farm prior to 2005.
3) Were not Amish.
4) Were in the state of Michigan.

In addition, dairy graziers were asked to identify other grazing dairy farms they were aware of in their area. This proved very helpful in finding dairy farmers who utilized grazing or MIG. One group that was specifically not targeted was the Amish population. Many Amish dairy farms utilize MIG, but this group was not targeted in this study as it

was assumed that financial data would be difficult to gather from Amish participants due to privacy concerns.

A listing of potential study participants was created and initial contacts were made or attempted with 112 Michigan dairy farms that were thought to be grazing. Table 3.1 shows the resulting breakout of the participation by these farms. Five initial contacts were found to be confinement herds that were not grazing, two had been MIG for more than 20 years which would have made data gathering very difficult, and six declined to participate during the initial telephone interview. An additional three farms declined to participate after receiving the data questionnaire packet. Thirty-four farms were either not MIG, did not fit the project characteristics, or were no longer milking cows and had quit prior to 2005.

Table 3.1 Contact Farms and Participation Level

# of farms	**Description**
112	Total number of farms contacted or attempted
- 14	No response to initial or repeated contacts
- 34	Farms that were not MIG, no longer milked cows, or didn't fit the study model. 55.9% (19) were not MIG grazing farms.
- 6	Declined to participate as a result of the initial phone interview
- 3	Declined to participate after receiving the questionnaire
- 2	Were MIG for more than 20 years
- 5	Were found to be confinement herds
- 19	Farms with missing data yielding them unusable.
29	Usable data sets

Methods

Of the 48 dairy farms using MIG practices that agreed to participation in this research project, 29 provided complete information for summarization. The initial contact was through a telephone interview. (Appendix A) Participants were asked to complete some questions about their experience with MIG, such as when they started

implementing it, why they decided to try it and their general impressions of MIG since using it. Willing participants were mailed the data questionnaire during March and April of 2007 following the initial telephone interview. The questionnaire packet of materials included a cover letter, the consent to participate in research form , and the data questionnaire (Appendix B) as well as postage paid envelopes to return completed forms.

Returns of the questionnaire were slow as timing of the initial contact and mailing conflicted with spring farm work and the start of pasture season. It soon became evident that farm visits would be necessary to help producers complete the questionnaire. During the summer and fall of 2007, farm visits were made to study participants. Meeting dairy producers in person added an improved dimension to the data gathering process as sitting down with dairymen and women allowed the investigator to better and more fully understand how these dairy farms work and what the producers think about MIG. In retrospect, more complete instrument testing would likely have provided valuable input to the difficulty participants would have with the breadth and scope of the data collection.

The final data gathering process consisted of a follow-up telephone interview or farm interview. This interview allowed participants to answer several open-ended questions (Appendix C) about their experiences with MIG. The telephone interview generally lasted 45 minutes but some interviews continued for two hours or more.

Chapter 4. Michigan Dairy Grazing Farm Profiles

1. Farm Characteristics

The farms in this study were primarily sole proprietorships. Twenty five of the 29 were owned and operated by a single family. The farms were from all areas of Michigan, indicating that no particular location in the state is better suited to grazing dairy cows.

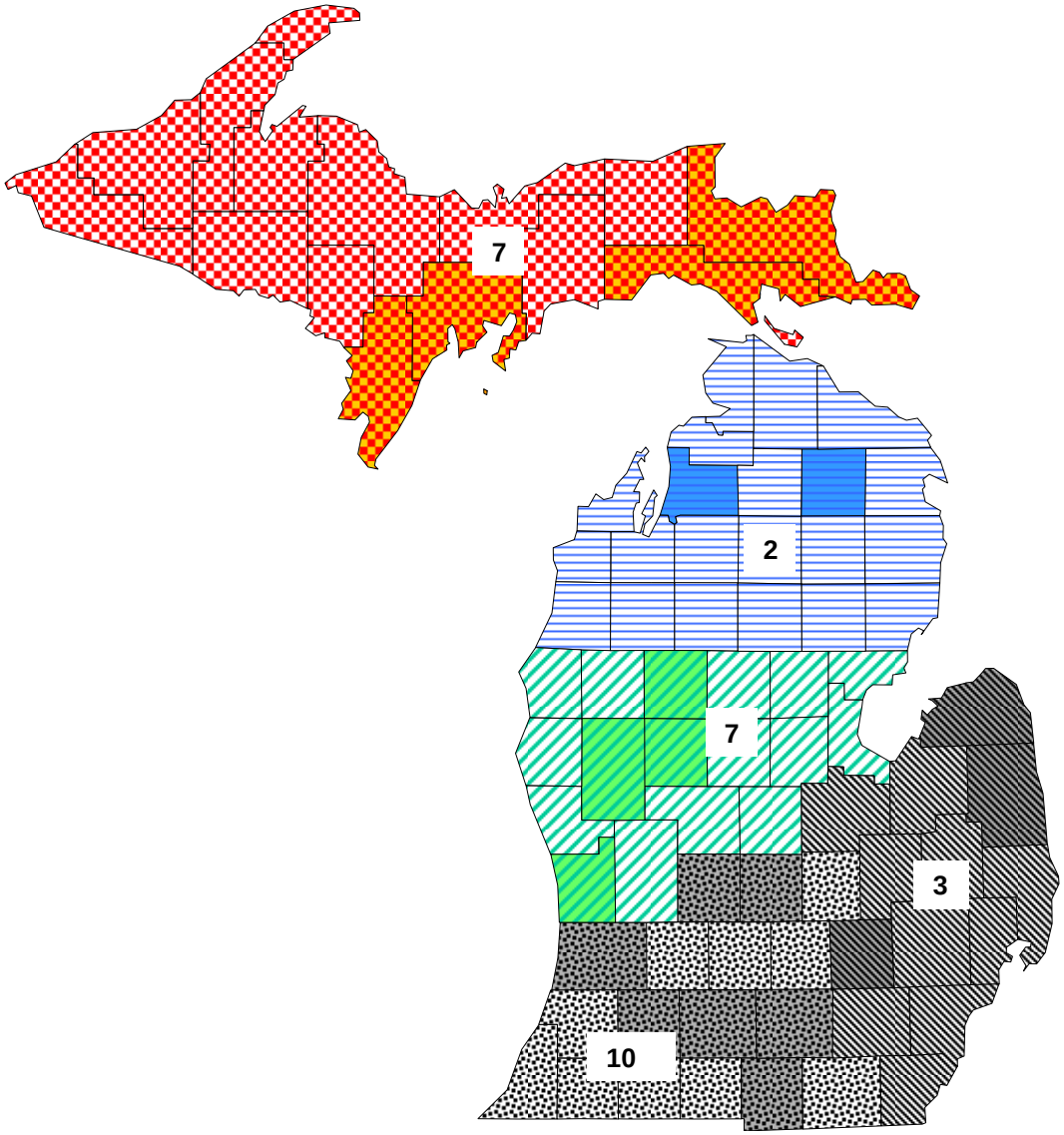


Figure 4.1 Location of study participants within MSU Extension Regions.

Figure 4.1 shows the location of participants. The different patterned counties represent the Extension regions in Michigan and darker shaded counties within the regions represent counties in which the participants farm. The southwest region had the most cooperators with ten and includes large dairy counties Clinton, Allegan, Hillsdale, and Ionia. The Central region and Upper Peninsula regions had seven cooperators each. The Central region includes large dairy counties Ottawa and Newaygo. The Upper Peninsula (UP) had a higher ratio of participants to dairy farms in the region as the UP has the lowest number of dairy farms of the regions shown. The North region had two participants and the Southeast region had three participants. The Southeast region includes the high dairy populated counties of the "Thumb" area: Sanilac, Huron, and Tuscola. This participation indicates that perhaps not all of the large dairy areas of the state have a representative number of intensive graziers, or that our methods to find farms in those areas were less successful than others. It is understood that the thumb area topography is more conducive to row crop production than other areas of the state.

The farmers possessed a great deal of experience as the average number of years that participants had been making management decisions on their farm was 24.5 years as of 2007. Of those 24.5 years, 21 years were spent on their current location, indicating that these farmers seldom, if ever, moved their farming operation. Seventy six percent of participants were operating their dairy in 2005 at the same location where they started dairying.

Only 13.8 % of the farms were using seasonal calving in 2005 while an additional 7 % of the farms attempted seasonal calving but found it difficult to keep cows in the breeding and calving window. Seasonal grazing dairy farms calve in late winter or spring

to take best advantage of the spring flush of pasture forage when cows are in peak milk production and forage intake requirements are highest. For calving intervals to fit the window, the cows are generally bred back approximately 90 days into lactation. For example, a grazing dairy with May first as its median calving date will target August 1 as its median breeding date. Kriegl (2007) demonstrated mixed results when comparing seasonal herds with non-seasonal herds in respect to Net Farm Income from Operations per Hundredweight equivalent and per cow. In years when the seasonal herds had a financial advantage, (2001 and 2004) they were aided with favorable milk price patterns during the spring and early summer compared to a more normal milk price pattern.

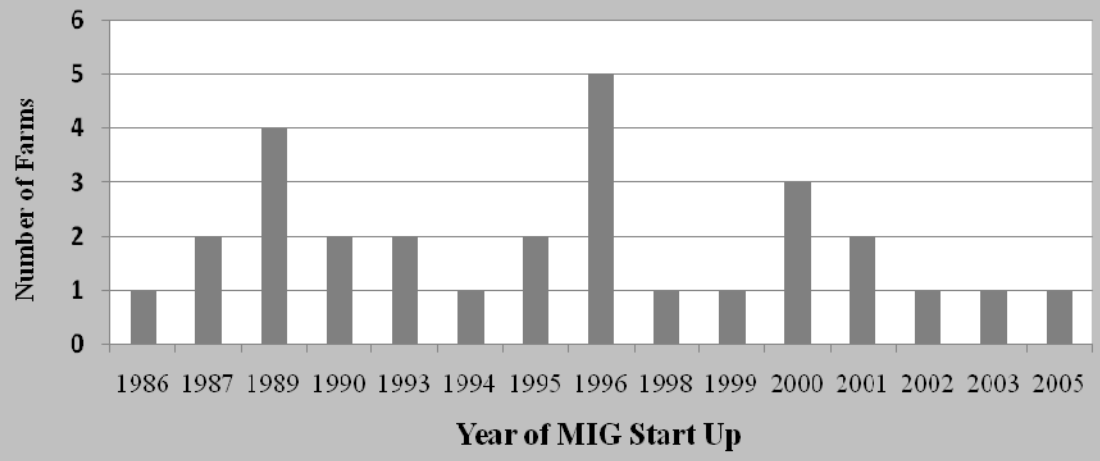
Most of the farms (52%) switched from a confinement management system, defined by cattle housed inside barns with no or only occasional access to outside lots for exercise purposes and not intended as a source of forage. Start-up dairies represented 10% of participants. Thirty eight (38%) percent switched from a non-intensive grazing management system that was defined as a pasture system where cows were either not rotated within a multiple paddock system, or were moved to a new pasture paddock after more than three to seven days. Various authors have defined the intensity of grazing in different ways but most agree that grazing farms are considered management intensive if they are moving cows to a new paddock at least weekly. In most cases, MIG dairy farms rotate more frequently. Ostrom and Jackson-Smith (2000) and Lloyd, et al (2007) used seven days as their criteria. Dartt, et al (1999) used a rotation frequency of at most three days and required 25% of the annual whole herd forage be supplied by grazing. Conneman et al (2006) used the 3-day rotation and at least 30% of forage supplied by

grazing during the growing season as criteria for farms to be included in their Dairy Farm Business Summary for Intensive Grazing Farms in New York.

2. The Year of the Switch

All the participating farms reported the year in which they made the conversion to MIG. The average year reported was 1995. That year was also the median and mode. The range of years was 1986 to 2005 with corresponding length of time since the switch of 19 to 0 years on MIG as of 2005. There were nearly the same number of farms with less than 10 years of MIG experience (15), known henceforth as "recent adopters", as there were with 10 or more years of MIG experience (14) known henceforth as "early adopters". Figure 4.2 shows the distribution of farms in the study by the year they reported starting MIG.

Figure 4.2 Distribution of MIG Dairy Farms by Start-up Year



3. Herd Characteristics

Milk Production

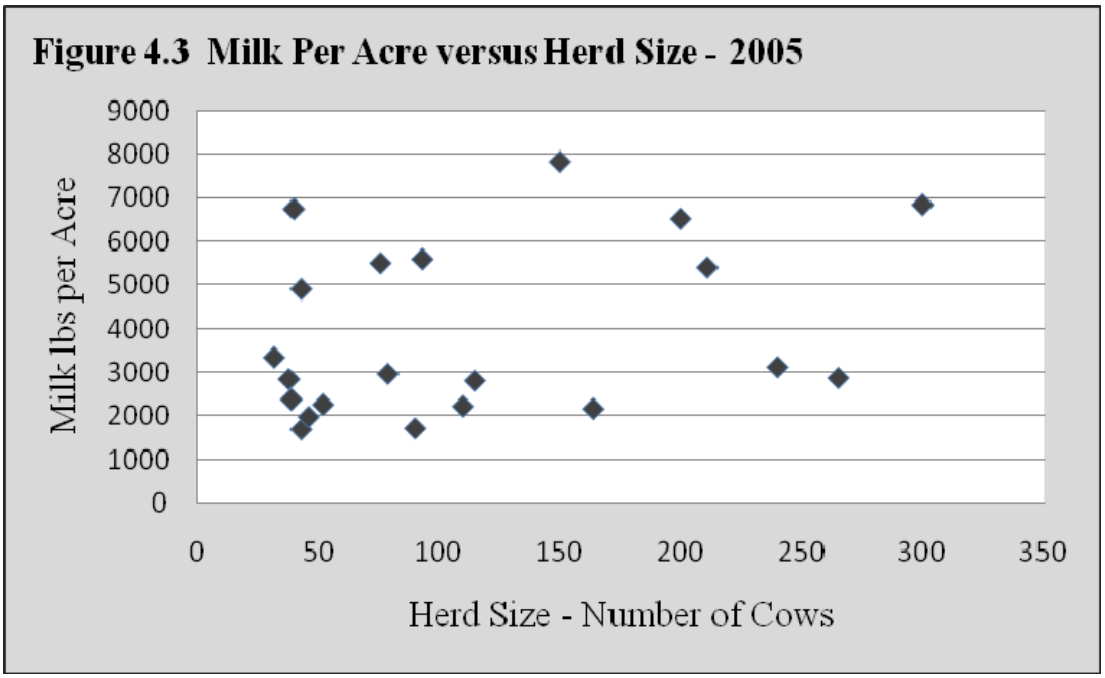
The 29 grazing dairy farms evaluated in this project increased herd size of milking and dry cows combined by 31.5% during their years on MIG from 76 cows to 100 cows (Table 4.1). Milk production over the same period did not change much as average milk shipped per cow per year began at 17,635 lbs then dipped to 16,348 lbs and rebounded to 17,262 in 2005. This production level demonstrates that these farms were

Table 4.1 Cow numbers and milk production of Michigan MIG herds and state average production per cow.

	Before MIG	**After MIG**	**2005**
Average number of cows	76	81	100
Years Reported	1993-94	1996-97	2005
Average Milk lbs shipped per cow per year	17,635	16,348	17,262
Average Michigan production per cow (NASS)	16,688	17,325	21,635

generally not interested in achieving high production and that minimal inputs using pasture as the primary source of forage during the grazing season results in little production growth over time. Table 4.1 also shows study farms compared favorably with the average Michigan farm in terms of production per cow during the early to mid 1990's. Not until the years between 1997 and 2005 did a significant separation occur between what study participants reported and the state average for milk production per cow as reported by the National Agricultural Statistics Service. (NASS 2007) The MIG farms did not keep pace with the rest of the state's growth in production per cow.

An efficiency measure that examines the efficiency of milk production for a farm is milk per acre of land farmed. Figure 4.3 displays the level of milk production per acre of study participants versus the herd size. There is no correlation between herd size or farm size and milk production per cow. What is surprising is the number of low milk pounds per acre farms included in the study. More than half of the farms (n=21) had milk per acre levels of less than 3,000 pounds in 2005. Comparably, the average milk pounds per acre of 156 dairy farms in the 2005 Michigan Dairy Farm Business Analysis



Summary (Wittenburg and Wolf, 2006) was 5,452. Within that group, the top 25 percent of the herds (ranked by Rate of Return on Assets – ROROA) averaged 6,350 pounds per acre while the bottom 25 percent achieved 4,491 pounds per acre. It must be noted that milk pounds per acre itself is not a highly regarded efficiency measure as farms differ considerably in the number of acres they farm compared to their herd size and production level. However, as land continues to become more valuable over time, grazing dairies must improve the efficiency of generating profit through the sale of milk. Milk per acre

will have a profound effect on the ability to be sustainable and compete with other land uses.

Cattle Breeds

Participants were asked to report the breeds in the herd before they switched to MIG and in 2005. There was considerable change in the breed make-up of the herds from before the switch to MIG to 2005. As Table 4.2 indicates, prior to MIG the farms were heavily populated with purebred cows as 85% of the herds had only one breed. Purebred here includes registered or grade cattle of the same breed. In addition, 96% of the farms included some purebred Holsteins and 15% had some purebred color breed cattle. By 2005, 61% of the farms had just one breed of cattle and only 3.5% had purebred color breeds. Table 4.2 compares the herds before making the switch to MIG to their status as of 2005 rather than immediately after the switch to MIG. This was to show the change in breed makeup after fully completing the switch and because it takes several years to constitute a change in the breed make-up of a dairy herd. The first two years following the switch to MIG many of the farms were still in the transition stages of their breeding program. By 2005, there were still many herds with purebred Holsteins as 93% retained some purebred Holsteins on the farm. There was a large change in the use of cross-breeding in these grazing herds as the percentage of farms using cross breed cattle increased from 7 to 52%. Examined from a cow number basis, the move away from purebred Holsteins is striking. Prior to the switch to MIG, the total percentage of cows that were purebred Holsteins in these herds was 90.5%. In 2005, the percentage of purebred Holsteins dropped to 68.2%. Conversely, the pure color breed cows increased

slightly from 9 to 10.7% and the cross-bred cattle increased substantially from just one half of one percent to 21%. The most common cross is a Holstein X Jersey, but other color breeds and some New Zealand genetics were reported. It is interesting to note that while the influence of the Holstein breed dropped substantially, the loss in milk production per cow of a mere 373 pounds was likely considerably less than would have been expected. Study participants appear to be less concerned about the loss of fluid milk production and more interested in the benefits of crossbreeding as described by Weigel and Barlass (2003) where 50 U.S. dairy producers reported "improvements in fertility, calving ease, and milk composition" when surveyed about crossbreeding on their dairy farms.

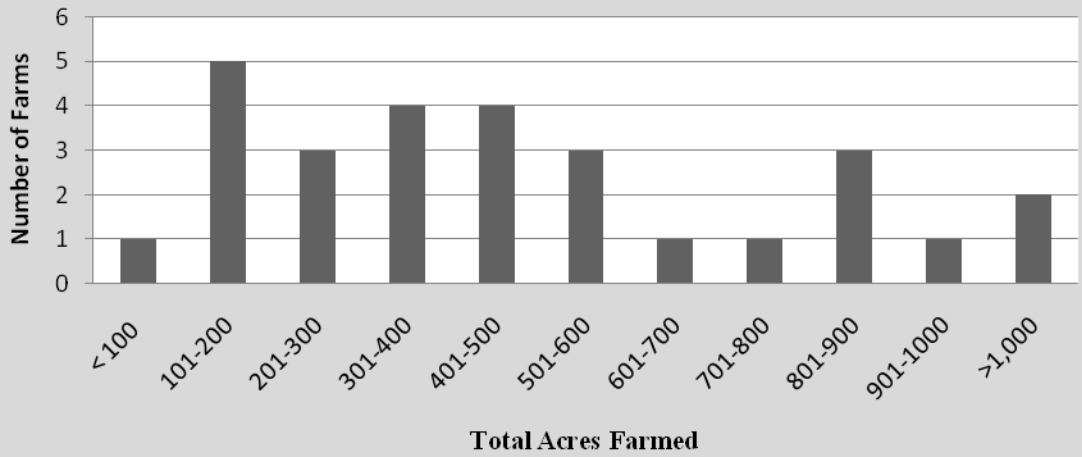
Table 4.2 Breed Makeup of Michigan MIG herds.

	Before MIG	2005
Average number of cows	76	100
Average Milk lbs shipped per cow per year	17,635	17,262
Percent of herds with 1 breed of pure-bred cows	85	61
Percent of herds with some pure-bred Holsteins	96	93
Percent of herds – some pure-bred color breed cows	15	3.5
Percent of herds with some cross-bred cows	7	52
All Farms - % Pure-bred Holsteins	90.5	68.2
All Farms - % Pure-bred Color Breeds	9	10.7
All Farms - % Crossbreds	0.5	21

4. Acres Farmed

The average acreage per grazing farm in this study did not increase significantly following the switch to MIG through 2005. The farms reported a dip in acreage in the

Figure 4.4 Distribution of MIG Dairy Farms by Total Acres Farmed - 2005



total acres farmed during the first two years after switching, then increased slightly through 2005. Figure 4.4 shows the distribution of farms based on total acres farmed. Seventy one percent of the farms were 600 acres or less. Of significance was the change in total acres used for pasture. These acres were used for pasture whether or not they were permanent pasture. Participating farms varied in how they reported permanent pasture. Some reported all acres as permanent, while others reported none of them as permanent, stating that most of the pasture acres are included in crop rotations and/or have hay crops harvested from them on occasion. Not surprisingly, acres used for pasture in 2005 were higher, in fact, triple that used for pasture prior to the farm's switch to MIG. (Table 4.3) The average farm more than doubled the acres (41 to 97) used for pasture after they switched to MIG. This would indicate an immediate and anticipated

addition of pasture acres at the time they made the switch to MIG. Four farms (13.8%) did not use any land for pasture prior to switching to MIG. Conversely, this indicates that

Table 4.3 Total Acres Farmed and Total Acres Used for Pasture, Pre and Post MIG and 2005

	Total Acres Farmed	Total Acres Used for Pasture	% Farmed Acres as Pasture	Total Acres Per Cow	Acres of Pasture Per Cow
Pre-MIG	452	41	9 %	5.95	.55
Post-MIG	437	97	22%	5.41	1.2
2005	481	135	28%	4.81	1.35

most dairy farms utilized some pasture for forage or acreage for exercise prior to MIG. It also indicates that these farms grew into grazing once they completed the switch because they continued to add pasture acres. By 2005, the farms had increased average total pasture acres to 135 acres or 28% of total farmed acres. With this rise in pasture acres, the average farm increased its acres of pasture per cow from 1.2 to 1.35 even though cow numbers increased on the average 31.6% from 76 to 100 cows. Conneman et. al (2006) found a similar pattern in New York where from 1996 to 2005, grazing dairy farms in the Cornell summary increased cow numbers from 78 to 95 (23%) and increased tillable acres farmed by just 3.5% (255 to 264 acres).

The largest reductions in acreage allocations were row-crops as grazing dairies decreased their corn grain acres by more than half, corn silage acres were reduced, soybean production was reduced, and other crop acreage was lower. There was a significant shift toward hay-crop and pasture production from just over half the acreage before MIG to more than 75% of the acreage in pasture and hay crops in 2005. (Table 4.4)

Table 4.4 Acres of crops pre* and post* MIG and 2005						
	Pre		Post		2005	
Crop	Acres	%	Acres	%	Acres	%
Permanent Pasture	35	7.8	81	18.5	112	23.1
Hay Crop – Legume	126	27.9	125	28.6	152	31.4
Hay Crop – Grass	80	17.7	71	16.3	99	20.5
Corn Silage	43	9.5	34	7.8	25	5.2
Corn Grain	96	21.2	71	16.3	49	10.1
Other Grain	63	13.9	47	10.8	40	8.3
Other Crops	9	2.0	7	1.6	7	1.5
Totals	452	100	437	100	484	100
* Pre and post represent the 2 years prior to (pre) and 2 years following (post) the switch to MIG.						

5. Skills Required for Successful Grazing

Participants identified up to six key management skills that an aspiring dairy grazier must know to be successful and ranked them in order of significance. Far and away the most important skills were related to managing the intake of pasture forage. Managing the production of pasture forage and making it available to the cows were the most highly recommended management skills that new graziers need to understand. The responses are summarized in table 4.5. Some skills were mentioned several times but were not as highly ranked when they were mentioned. For example, proper pasture design and layout was mentioned 12 times, but had a lower weighted response average than did changing mindset/having an open mind. One must change the mindset from confinement dairying, design and layout an appropriate pasture system and then make a priority of managing the pasture forage and cow intake to gain the greatest advantage of the feed nutrient available from pasture forage. These graziers were conveying the message that when converting to MIG or starting up a dairy with MIG, the focus has to be on the pasture. These dairy producers seem to understand that once this is

accomplished, the other benefits of profit, time off, and healthier cows will come to fruition.

Table 4.5 Skills identified to be a successful MIG dairy operation.

Skill	Frequency of ranking						Points *	% of Total Points
	1st	2nd	3rd	4th	5th	6th		
All others (patience, be flexible)	2	6	5	6	3	1	87	20.3
Manage Pasture Forage Intake	5	4	4	1	0	0	69	16.1
Manage the Pasture Forage	8	2	1	1	1	1	68	15.9
Change your mindset/have an open mind	6	1	1	1	0	1	49	11.4
Proper pasture design and layout	1	3	4	2	1	1	46	10.7
Make the cows your priority	1	6	0	1	1	0	41	9.6
Become educated about MIG	1	1	5	1	0	1	35	8.2
Provide enough land for grazing	1	1	1	0	0	0	15	3.5
Have a true desire to graze	2	0	0	0	0	0	12	2.8
Focus on Profit, not production	1	0	0	0	0	0	6	1.4

* Points calculated by weighted response where 1st rank = 6 pts, 2nd = 5, etc.

6. Education and Information Sources

Nearly half of the grazing dairy producers participating in this study completed high school but had no higher education experience. The other half had some higher education. Table 4.6 shows education levels for the farms, and stratified by years of MIG experience. Average years of education were 13.3, 13.3, and 14 for producers who had MIG experience less than 10 years, 10 to 15 years, and greater than 15 years respectively.

Where graziers get their information is important for Extension educators and consultants and may be significant to dairy producers contemplating a management change to MIG or for those starting a dairy farm and considering a grazing operation.

Participants were asked to rank the sources of information they used for general

Table 4.6 Years on MIG vs. Education Level					
Education Level	**All Farms Number**	**All Farms Percent**	**Years on MIG**		
			< 10	**10 to 15**	**> 15**
High School	14	50.0	6	6	2
2 Yr. Degree or some college	7	25.0	1	2	4
4 Yr. Degree	6	21.4	3	1	2
Advanced Degree	1	3.6	0	1	0
Totals	28	100.0	10	10	8
Average # of Years of Education >>>			13.3	13.3	14

farming practices and grazing practices. Rankings were based on a scale where one (1) was the highest ranking. Table 4.7 provides average ranks for nine sources. For general farm information, graziers found other farmers to be their most valuable source of information followed closely by Dairy magazines and Extension programs. It was no surprise then that they also ranked other farmers highest for specific information about grazing, followed closely by grazing magazines and Extension programs. Not only did they rank these three sources highly, they were also among the highest used sources. There was a large separation from these three sources and the next highest ranked sources – dairy magazines and Extension materials – even though they also were used by more than half of the respondents. These results are somewhat contrary to an earlier effort by Cunningham (1993) as reported by Hanson (1998) to ask graziers about where they received information. Cunningham's work in the early 1990's showed that only 16% and 28% of respondents attributed gaining information from Extension sources and other farmers (neighbors), respectively. Two possible explanations for this difference could be that Cunningham also provided "personal experience" and "family tradition" as sources of information. And secondly, the age of the study places the questions at an

early stage of the increased interest and adoption of MIG. At that point in time, fewer resources existed, especially from Extension Educators, and fewer MIG graziers existed. Today, there are magazines specifically written for intensive graziers and Extension organizations in many states have grazing specialists on staff. Neither study found that

Table 4.7 Sources and rank of information used by MIG dairy producers. Listed by average rank (1=highest) of grazing information sources.

	General Farm Information		Grazing Information	
	% Use this Source	Ave. Rank	% Use this Source	Ave. Rank
Other Farmers	65.5	2.8	69.0	1.8
Grazing Magazines	31.0	3.6	51.7	1.9
Extension Programs	65.5	3.1	69.0	2.3
Dairy Magazines	65.5	2.9	58.6	3.6
Extension Materials	72.4	3.6	65.5	3.6
Industry Materials	48.3	5.3	34.5	4.7
Industry Programs	48.3	4.4	13.8	5.3
General Farm Magazines	72.4	3.9	20.7	5.8

farmers utilized information on grazing available through industry sources, an indication that early on, industry did not see MIG as a growth area in dairy or a viable option for a large segment of the industry.

7. Early versus Recent Adopters

Participants were divided into two groups based on the year they switched to MIG. Early adopters were the fourteen farms that switched prior to 1996 while the fifteen recent adopters switched in 1996 or later. Table 4.8 shows various characteristics of the two groups. There was virtually no difference between the groups in regard to the years of grazing experience before converting to MIG. The early adopters reported grazing an average of 3.8 years while the recent adopters reported just 2.8 years of grazing before

switching to MIG. Both groups had a similar number of farms that did no grazing prior to switching to MIG. This would indicate that for dairy farms considering a switch to MIG, it is not necessary to currently be grazing and that a switch from total confinement to MIG is feasible.

Another interesting statistic is the lower growth rate in herd size of the recent adopters compared to the early adopters. Early adopters have grown the dairy herds by an average of 54% while the recent adopters have grown by just 7.9%. Certainly the

Table 4.8 Characteristics of early and recent adopters of MIG.

Characteristic	Early Adopters	Recent Adopters
Average year began MIG	1990	1999
Average years on MIG	15.4	7.7
Average years of management experience	31.4	18.1
Years of grazing experience	20.4	10.5
Years of grazing before MIG	3.8	2.8
Zero years of grazing before MIG (# of farms)	8	7
Average No. of cows Pre MIG	80.4	71.1
Average No. of cows Post MIG	93.8	67.8
Average No. of cows in 2005	125.1	76.7

early adopters have had more time to expand, however the attitude about expansion seems to differ between the two groups in that the largest expansions were done by the early adopters as the six largest expansions occurred in early adoption herds and five of those were greater than 100% expansions. Both groups had the same number of farms that either reduced herd size or expanded ten percent or less. This data suggests that recent adopters of MIG may be less interested in expanding herd size.

8. Satisfaction with Management Intensive Grazing

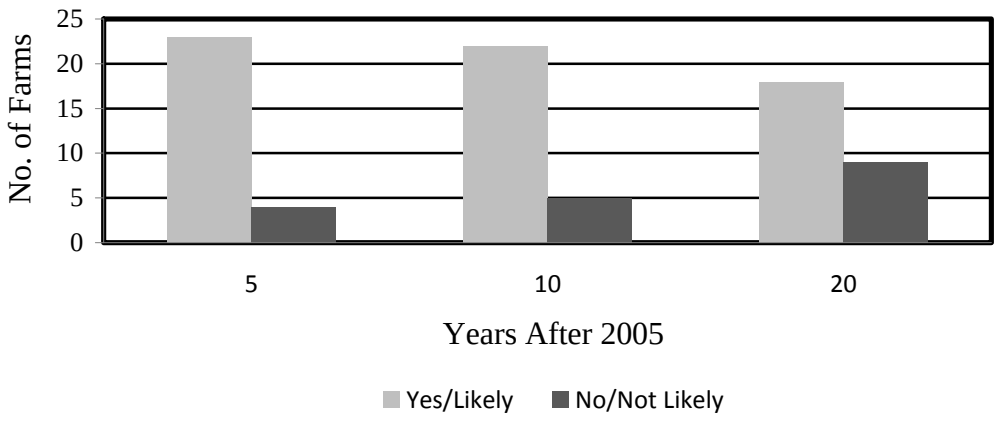
Participants were asked to rate their over-all satisfaction with MIG on a scale of 1 to 10 with 10 being completely satisfied. Those who converted from confinement

management averaged 8.9 while those who converted from non-intensive grazing reported a satisfaction level of 8.7. Early versus recent adopters differed little as early and recent adopters reported a satisfaction level of 8.9 and 8.7 respectively.

9. Farm Longevity and Sustainability

Perhaps the simplest measure of a farm's success is its sustainability. Un-successful farms do not continue to operate. Study subjects were asked to report their expectations for farm longevity by responding with yes, no, likely, or not likely when asked if they or someone would still be producing milk on their farm in 5, 10, or 20 years in the future, using 2005 as the base year. The results indicated that 23 of 27 respondents

Figure 4.5 Expected Farm Longevity After 2005 - 5, 10 or 20 Years



(81.5%) expected that they or someone else would be milking cows on their farm in 5 years. That percentage held strong at 70.4% for those expecting to be milking cows in 10 years but dropped to just 33.3% for 20 years into the future. Figure 4.5 shows the results

of combining those who said yes or likely, the percentages are 85.2, 81.5, and 66.7% respectively. There was little change over the 3 time periods for those who responded that no one would be milking cows on their farm. There was change in those responding "not likely", from 3.7% in 5 years to 14.8% in 20 years. This indicates a positive attitude about the future of these grazing dairy farms, even if the current operator will not necessarily be the operator in the future.

Chapter 5. Propositions

PROPOSITION 1. **Management Intensive Grazing dairy farmers were less able to grow the dairy business than conventional dairy farms as measured by net worth.**

Net worth, also referred to as equity, is a key financial measure of success for farms and other businesses. The Farm Financial Standards Council (FFSC) (1997) describes it as a measure of the ownership interest in the farm business and could be considered as the claim of the owner's equity against the assets of the business. Net worth is calculated by subtracting liabilities from assets and is the end result of constructing a balance sheet.

To improve net worth, farms must generate a positive net farm income (be profitable) and meet cash flows including making principle and interest payments on borrowed capital (improve solvency). Accomplishing these two measures of farm financial performance (profitability and solvency) allow for farms to reduce liabilities, purchase or invest in more assets, or do both. By demonstrating the ability to increase equity or net worth, thereby increasing the difference between assets and liabilities, farms will improve the financial position of their dairy business. The Farm Financial Standards Council (1997) defines financial position as "the total resources controlled by a business and total claims against those resources at a single point in time. Measures of financial position provide an indication of the capacity of the business to withstand risk from future farming operations and provide a benchmark against which to measure the results of future business decisions." It is this benchmark comparison that we intended to

measure on the grazing farms in this study. Tracking net worth and the change in a farm's net worth provides some of the information needed to answer questions about whether the farm's financial position is improving and/or is better able to handle current and future risks to the farm business.

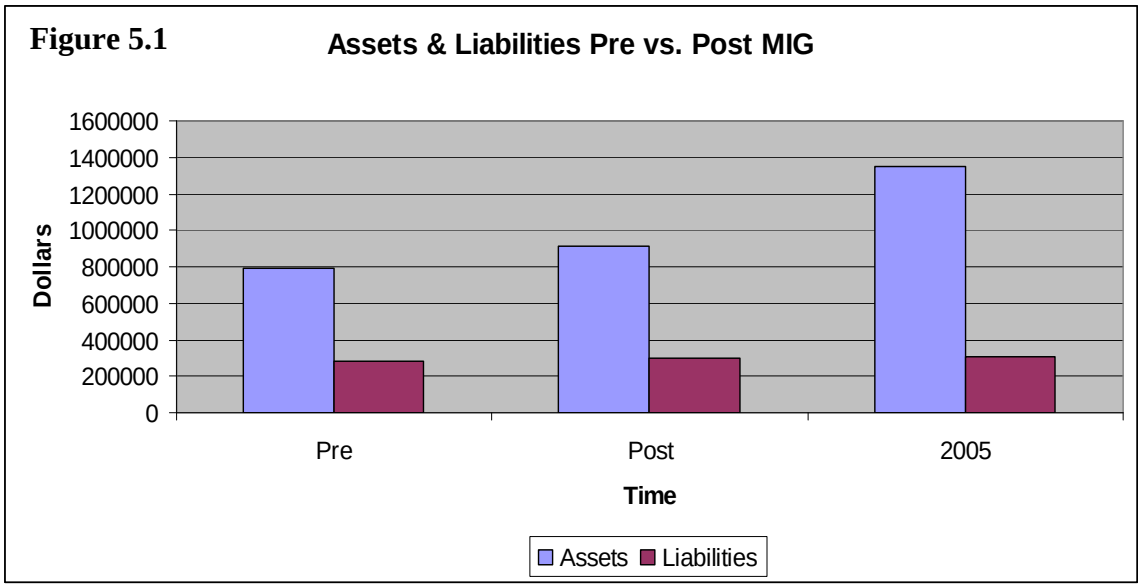
There are two bases for measuring net worth, cost and market. Hofstrand (2006) defines the cost basis approach to net worth calculation as valuing an asset based on its original purchase cost, less depreciation, plus improvements to the asset. He describes the market bases approach as valuing assets based on their current market or sale value. The market approach measures the solvency of the business. FFSC (1997) lists solvency as one of the five financial criteria used for farm business analysis and describes it as "the measure of the amount of borrowed capital (or debt) and other obligations used by a business relative to the amount of owner equity in the business".

Grazing dairy farms might be expected to lag in their ability to build the net worth of their business because of perceptions that they generally lack high production per cow, do not make large herd expansions or increase farm size, and maintain small facilities and reduced equipment lines.

In our study, the average net worth of farms reporting net worth data in the two years prior to switching to MIG was $452,724 (n=7). The average net worth of farms reporting net worth the first two years after switching to MIG was $565,564 (n=9). In 2005, the average net worth of farms reporting net worth information was $1,014,236 (n=15). While the data is limited, they indicate that grazing dairy farms were able to increase net worth following the conversion to MIG. As was discussed above, these grazing farms – on average – minimally increased the number of acres of crops as acres

farmed increased by 29 acres from before MIG to 2005. The grazing farms grew 31.6% in cow numbers during this time period and accomplished the growth in net worth by holding liabilities fairly steady while increasing assets over time.

Figure 5.1 shows how assets and liabilities changed from before and after the



switch to MIG and the year 2005. Some of these herds did not report balance sheet data for each time period – before and after their switch to MIG and for 2005. A more detailed review of the net worth data is displayed in Table 5.1 that shows the farm net worth information on a per cow and per acre basis. Fifteen farms provided data for at least some years.

Table 5.1 Net Worth per cow and per acre for farms reporting net worth.

	Pre MIG (n=7)	Post MIG (n=9)	2005 (n=15)
Net Worth	$ 452,724	$ 565,564	$ 1,014,236
Number of Cows	100	122	138
Net Worth/Cow	$ 4,527	$ 4,636	$ 7,350
Total Acres Farmed	556	529	591
Net Worth/Acre	$ 814	$ 1,069	$ 1,716

A comparison of like herds is found in Table 5.2 where seven herds reported complete balance sheet data before and after their switch to MIG. These herds were able to improve their net worth from $425,191 in 1995 to $1,220,334 in 2005 a 187% increase in 10 years. They reduced their debt to asset ratio by nearly half from 40.1 to 22.7. And they improved their net worth by $4,403 per cow and $1,671 per acre.

Table 5.2 Net worth information for seven farms reporting all three time periods – pre, post, and 2005

	Pre MIG (2-year average)	**Post MIG (2-year average)**	**2005**
Assets	$709,360	$993,826	$1,578,857
Liabilities	$284,169	$322,799	$358,523
Net Worth *	$452,724	$671,027	$1,220,334
Net Worth/cow	$4,527	$5,284	$8,655
New Worth/acre	$814	$1,179	$2,436
Debt to Asset Ratio	0.400	0.325	0.227
Total Acres	556	569	501
Total Cows	100	127	141

* Net worth does not equal assets less liabilities for Pre and Post MIG columns due to 2-year averaging. Pre and post MIG represent the two years prior to (pre) and following (post) the switch to MIG.

One difficulty in our data gathering was the amount of time that had elapsed since some of the farms made the switch to MIG. With many years having passed, some farms no longer had the financial data we were seeking. It was expected that these seven farms – because their financial data was complete - would have reported starting MIG later than the whole study group since they were able to provide complete balance sheet data for all time periods. However, the average farm in our study switched to MIG in 1995, while these seven farms made the switch in 1996. Early adopters had equally complete financial information as more recent adopters. These seven farms were larger

than the average farm in the study as they had 31.6% more cows pre-MIG (100 cows versus 76) and 41% more cows in 2005 (141 cows versus 100). They reduced total acres farmed by nearly 10% (556 to 501 acres) which helped them increase net worth per acre more than three-fold from $814 to $2,436 per acre. This reduction in acres farmed combined with an increase in cow numbers reduced their acres per cow from 5.56 to 3.55. On a per cow basis, they were more efficient than the larger group of farms reporting net worth as their net worth per cow in 2005 was $1,305 more than the larger group ($8,655 versus $7,350). They also had a net worth per acre $720 higher than the larger group ($2,436 versus $1,716) in 2005.

Table 5.3 shows results from the 1996 (Nott 1997) and 2005 Michigan Dairy Business Analysis Summaries (Wittenberg and Wolf 2006) from grazing and non-grazing

Table 5.3 Net Worth per cow and per acre for Michigan dairy farms in 1996 and 2005.

	Net Worth (market)	Cows	Net Worth Per Cow	Total Acres Farmed	Net Worth Per Acre
1996 (N=146)	$ 855,178	158	$ 5,413	601	$ 1,423
1996 top 25% based on NFI* (n=37)	$ 1,367,953	241	$ 5,676	751	$ 1,822
1996 Farms with 76 to 120 cows (n=33)	$ 598,875	99	$ 6,049	420	$ 1,426
2005 (N=156)	$ 1,806,138	194	$ 9,310	742	$ 2,434
2005 top 25% based on RORA** (n=40)	$ 1,960,221	220	$ 8,910	772	$ 2,539
2005 Farms with 25 to 99 cows (n=40)	$ 933,436	68	$ 13,727	382	$ 2,443
2005 Farms with 100-249 cows (n=83)	$ 1,650,839	163	$ 10,128	637	$ 2,592
2005 Grazing Dairy Farms	$ 1,038,171	115	$ 9,028	401	$ 2,589

* NFI – Net Farm Income
** RORA – Rate of Return on Assets

dairy farms. The results from these years were chosen because they correspond with the years selected for the study data. There was no grazing farm summary completed for Michigan in 1996. The table allows us to compare the net worth per cow and per acre of different groups of dairy farms. Shown are the top 25% of herds based on Net Farm Income (NFI) in 1996 and Rate of Return on Assets (RORA) in 2005. There is an additional group of farms in 1996 and two groups of farms in 2005 that were added based on herd size. These groups correspond most closely with the herd size of the grazing dairies in the corresponding years. The larger size of the average farm and farms in the top 25% gives these groups an advantage in total net worth in both years. However, when examining the data based on size of production unit, the smaller herds and the grazing farms compare favorably. By comparing the net worth per cow and per acre from grazers to non-grazers we see that grazers have a comparable net worth per cow and per acre. A potential problem with analyzing farm net worth between farms or groups of farms is that personal or non-farm balance sheet information may not be included on all farms. It is plausible to expect some dairy farms to convert gains in farm net worth to other investments that diversify their portfolio. It is also critical to understand whether real properties like land and private dwellings were included or excluded in the calculation of net worth. For purposes of this research, real properties were included in asset and liability calculations whether valued as farm or non-farm.

Looking at net worth from the standpoint of early versus recent MIG adopters, we would have expected the early adopters to have a greater net worth per cow in 2005 since they have been farming longer and have had more time to build wealth. The opposite however, is true with our data from 2005 balance sheets. The recent adopters had an

average net worth per cow of $10,883 while the early adopters had an average net worth per cow of $8,589. Part of the explanation for this could be the herd size as recent adopters had fewer cows than early adopters in 2005 (98 versus 156). With adequate numbers of farms, a comparison could be made between similar herd sizes to remove this bias. On a net worth per acre basis, the recent adopters had a higher net worth per farmed acre Pre MIG and the early adopters had a higher net worth per farmed acre in 2005. Farmed acres includes rented acres, which do not directly affect net worth. If we examine net worth per owned acre, the recent adopters with less owned acres – whether by choice or by lack of time to accumulate land – have a greater net worth than the early adopters, both pre MIG and in 2005. This could be explained by the fact that land assets have a significant impact on net worth as land often makes up a large proportion of the asset side of the balance sheet. Wittenberg and Wolf (2006) report grazing dairy farms in Michigan in 2005 had 41.8% of total assets in land (market basis) and all Michigan dairy farms had 31.4% of total assets in land.

Table 5.4 Net Worth comparison of early and recent adopters of MIG

	Early Adopters		Recent Adopters	
	All Farms[1]	Same Farms[2]	All Farms[1]	Same Farms[2]
Average Year Starting MIG	1990	1992	1999	1999
Net Worth Per Cow Pre MIG	$ 3,370	$ 3,370	$ 5,729	$ 5,729
Net Worth Per Cow 2005	$ 8,589	$ 7,791	$ 10,883	$ 11,158
Total Farmed Acres/Cow Pre MIG	6.5	7.6	6.3	4.4
Total Farmed Acres/Cow 2005	4.3	3.4	6.4	5.0
Net Worth/Farmed Acre Pre MIG	$ 661	$ 661	$ 1,807	$ 1,807
Net Worth/Farmed Acre 2005	$ 3,245	$ 3,684	$ 2,972	$ 2,551
Net Worth/Owned Acre Pre MIG	$ 1,177	$ 1,177	$ 2,894	$ 2,894
Net Worth/Owned Acre 2005	$ 5,338	$ 5,264	$ 6,996	$ 5,328

1) All farms = all farms reporting net worth data for the year in question.
2) Same farms = farms that reported new worth data in both years, pre MIG and 2005

Another reason could be valuation of assets – particularly land, where early adopters may not have increased the market value of land on more recent balance sheets. This may be due to reduced need to borrow money, which requires updated balance sheets. It may also reflect a conservative value of their life style with regard to financial position.

PROPOSITION 2. **Grazing dairy producers rely more heavily on non-farm income, their own or from their spouse, to meet family living requirements after switching to MIG.**

Only 10% of the farms in the study reported non-farm income for the primary farm operator prior to switching to MIG and in 2005. The first two years after switching to MIG, 14% of the farms reported non-farm income for the primary operator. This 14% included the 10% that were receiving non-farm income before switching to MIG. Therefore, only 4% more farms received non-farm income after switching to MIG than received it before the switch. In 2005, there were again only 10% of the farms receiving non-farm income. Two thirds were the same as pre and post MIG switch, while one third received non-farm income for the first time. The level of non-farm income averaged $40,710 prior to MIG, $42,274 the first two years after switching, and $47,000 in 2005. These levels indicate that the primary operator received enough non-farm income for most of the family living requirements. The U.S. Census Bureau reports the average median household income in the U.S. and Michigan from 2002 to 2004 was $44,473 and $44,476 respectively.

Of those that received non-farm income prior to their switch to MIG, only 10% reported non-farm income from the spouse of the primary operator. The average level of income provided to the household from non-farm spousal income sources was $23,167. After switching to MIG, more farm families received non-farm income as the number reporting spousal non-farm income increased to 30% and the level of income rose to $26,139. In 2005, 38.5% of farms reported non-farm spousal income that averaged

$33,000. There were very few farms (12% or less in any time period) that paid the spouse and the amount paid was very small compared to the non-farm spousal income reported. This data is shown in table 5.5.

Table 5.5 Non-farm income sources and amounts.	**Pre MIG**	**Post MIG**	**2005**
Percent of farms reporting non-farm income for the primary operator.	10%	14%	10%
Average level of non-farm income received by primary operator	$ 40,710	$ 42,274	$ 47,000
Percent of farms reporting non-farm income from the spouse of the primary operator.	13.6%	37.5%	38.5%
Average level of non-farm income received by spouse	$23,167	$ 26,139	$ 33,000
Percent of farms reporting spousal income from farm	9.5%	8.7%	12%
Average level of income paid to spouse from farm	$3,600	$3,600	$3,200

These data might seem to indicate an increased reliance on non-farm income, particularly from the spouse, after switching to MIG. There are potential alternative views of this that would contradict the proposition stated above. These alternatives would include:

* Spousal non-farm income may have increased because the spouse's labor was no longer needed on the dairy and there was time available to seek opportunities for non-farm income that was sought by choice rather than necessity.

* Spouses (almost solely females) became participants in the labor market as children grew and left the home over time, allowing these spouses the time to seek non-farm income. Farms with spousal income post MIG in 2005 averaged 26.8 years of dairy farm management experience. This is only slightly more experience than the average of all study participants reported earlier at 24.5 years.

In their survey of more than 2,000 northeastern U.S. dairy farms, Parsons, Luloff, and Hanson (2004) indicated that reliance on off-farm income for grazing farms was

identical to that of confinement herds.

PROPOSITION 3. **Dairy producers implementing MIG reduced feed costs – as measured per cow per day and per hundredweight of milk sold - by switching to an intensive grazing system.**

Feed costs represent the single largest cash expense item for dairy farms. On financial analysis reports such as income statements or cost of production reports, feed expense is usually measured by purchased feed costs. However, the true cost of feed includes the crop related expenses incurred in procuring home grown feed as well as the purchased feed. A complete analysis of feed costs would also have to include the non-cash depreciation costs on the portion of machinery used to grow, harvest, and handle the feed and the depreciation costs on the storage structures. In addition, some of the labor expense on dairy farms is spent to produce and procure feed. However, seldom is labor for feed production separated from labor for other dairy operation like milking or herd management. Kriegl, et al (2007) found that while grazing dairy farms spend considerably less for feed per cow than confined herds, feed costs are still the largest single cash expense item for grazing dairies in the great lakes region. In fact, his research of Wisconsin dairy farms found that the top five expense items for grazing herds were the same as confinement herds on a per cow basis. Only the order from largest to smallest of

Table 5.6 Top five costs (as a percent of gross cash farm income) of representative dairy farms in Wisconsin and the Great Lakes Region.

	Wisconsin Confinement (n=736)	**Wisconsin Graziers (n=26)**	**Great Lakes Graziers (n=107)**
Purchased Feed	18.8 %	20.5%	22.2%
Non-livestock Depreciation	10.1%	9.7%	10.2%
Paid Labor & Management	10.5%	5.6%	7.6%
Interest	5.7%	5.0%	4.4%
Repairs, all	5.3%	4.8%	6.4%

the five differed. Table 5.6 lists the comparison of Kriegl's work with 11 years of data on Wisconsin farms – average of 736 confinement herds and 26 grazing dairy farms. – and an average of 107 grazing dairy farms in the great lakes region.

In order to investigate the change in feed cost per day per cow, per cwt. of milk, and per pound of dry matter fed, study participants were asked to identify four rations that they had fed to their cows before and after switching to MIG. A pre-switch summer and winter ration and the same summer and winter rations fed after their switch were recorded. Average daily feed costs were calculated using representative real dollar values for feedstuffs included in the rations during the time span from 1996 to 2005. These were standard prices used for various forage and concentrate sources during the years that these producers made their switch. Table 5.7 shows prices used to calculate the average daily feed cost under each management system and during the season of the

5.7 Ration Ingredient Prices - $ per as fed pound and $ per ton

Forages	$/lb As Fed	$/ton As Fed		Concentrates	$/lb As Fed	$/ton As Fed
Corn Silage	.013	26		Dry Corn Grain	.05	100
Legume Haylage	.023	46		High Moisture Corn	.037	74
Legume Hay	.075	150		44% SBOM [2]	.128	256
Grass Silage/Balage	.015	30		Distillers Grain	.09	180
Grass Hay	.045	90		Protein Concentrate	.15	300
Pasture – non-intensive	.012	24		Whole Cottonseed	.13	260
Pasture – MIG [1]	.008	18		Mineral Mix	.36	720
				Complete Feed 16% [2]	.0935	187

1. Estimated Costs of Pasture and Hay Production. Barnhart, Duffy, & Smith 1996 & 2000.
2. Halley 1998. USDA ERS Agricultural Prices 1997 Summary. 1998 and USDA ERS Agricultural Prices 2004 Summary.

year. It is important to note these prices reflect approximate market prices for forages and commodities. Participants were not asked to report prices paid for purchased feeds

nor values established for feeds in inventory. Prices for soybean oil meal, corn, and complete dairy feed were obtained from USDA ERS historical price data.

Pasture Cost

Pasture cost per pound as fed is difficult to determine. Tozer (2003) reported and used pasture forage cost of $0.0528/kg DM ($0.024/lb DM X .20 = $0.006/lb as fed) based on work by Elbehri and Ford and Moore.

One approach we used estimated costs from Extension bulleting AG-96 from Barnhart, Duffy, and Smith (2000) at Iowa State University. They determined that the total cost of pasture included the initial cost per acre for establishment or renovation plus the annual cost per acre for maintenance. Their work amortized over a five-year period the initial cost of improving pasture or establishing pasture. Life of a pasture stand can far exceed this time frame in actuality, thereby reducing considerably the initial cost per pound of forage of establishing a pasture for dairy cattle. For our purposes, we used the 5-year amortization. These estimated costs divided by a reasonable yield of 2 tons of DM per pasture acre under MIG results in a cost for a legume & grass mixed pasture of $0.006 per as fed pound.

Cost of Improvement/Establishment – Amortized	$ 35.82/Acre
Cost of Annual Maintenance – Legume/Grass Mix	$ 80.74/Acre
Total yearly cost	$ 116.56/Acre

Another method used was to examine previous studies that have measured pasture herbage to establish a yield. Then, using custom harvest cost data as an approximation

for harvest expense, calculate the value of the forage as a standing crop. Finally, add in the amortized establishment or improvement cost per acre described by Barnhart (2000) to arrive at a cost per as fed pound.

Sanderson, et al (2005) determined a yield of 8,000 kilograms of dry matter per hectare during grazing seasons in 2002 and 2003 in Pennsylvania. Their work was with milking dairy cows and measured herbage mass before and after each grazing cycle. Martz, et al, (1999) measured pasture disappearance by steers in Missouri to be an average of 6,624 kg of DM/ha. The conversion of these measurements to tons per acre results in an average of 13.55 as fed tons per acre. These data place the yield of pasture forage for dairy cattle at about 2.71 tons of DM per acre assuming 20% dry matter.

Dartt and Schwab (2002) reported in The 2002 Custom Machine Work Rates in Michigan that hay harvesting charges for the whole operation of cutting, raking, baling and hauling small square bales averaged $1.30 per bale. Therefore, using method two described above provides a cost per pound of pasture forage as fed is $ 0.008.

2.71 tons dry matter / .90 (dry matter at Hay Equivalent) = 3.01 tons H.E. per acre.

3.01 tons X 2000 lbs = 6,020 lbs of H.E. per acre

6,020 lbs of H.E. / 45 lb per bale = 133.8 bales per acre

133.8 bales X $1.30 custom rate per bale = $ 173.94 per acre harvesting cost

$173.94 + $ 35.82 = $ 209.76 per acre

The value per pound of forage = $209.76 / (13.55 X 2000) = $ .008 / lb as fed

In addition to the establishment and annual maintenance costs of pasture are the initial fencing investments. The pasture fencing investment adds very little to the cost of an as fed pound of pasture forage because of the length of time over which fencing is amortized.

Participants of our project were asked about initial fence investment. The average fencing investment producers made was $3,629 in fencing. Those who reported an initial fencing investment (n=21) reported an average of 85 pasture acres after making the switch to MIG resulting in a cost of fencing per acre of $ 42.69. A few participants reported initial costs for fencing on a per foot basis and the average was $ 0.80 per foot for high tensile perimeter fence, usually with a minimum of three and a maximum of five strands. The average number of acres of pasture reported by participants within the first two years after switching and 2005 was 106 acres. To arrive at a realistic cost for fencing, it was assumed a simple square field of 106 acres to be enclosed with high tensile fence at a cost of $ 0.80 per foot.

$$106A \times 43{,}560\ ft^2 = 4{,}617{,}360\ ft^2$$

$$\sqrt{4{,}617{,}360} = 2{,}149\ ft \times 4 = 8{,}595\ ft.\ of\ \ perimeter\ \ fence$$

8,595 feet X $0.80 = $ 6,876 / 106 A = $ 64.87 /A for perimeter fence

Most dairy graziers utilize break fence, usually a single strand of electrified poly or hi-tensile wire, to separate paddocks. Study participants reported an average paddock size of 5.7 acres. The 106 average pasture acres would split into 18 paddocks requiring 9 break wires to dissect the acreage. Single strand break wire was reported at about $ .20 per foot.

9 X 2,149 feet = 19,341 feet of break wire X $ .20 = $3,868

Total average fence investment

$6,876 + $3,868 = $10,744 / 106 = $101.36 per acre.

Amortized over the expected 20-year life of hi-tensile fencing, this amounts to $ 5.07 per acre per year. Put another way, $10,744 / 20 years = $537.20 per year.

$ 537.20 per year / (2 ton DM yield X 106 A) = $ 2.53/ ton pasture DM.

$ 2.53/2000 = $ .0013 per lb pasture DM

$ .0013 X .20 (% pasture DM) = $.00026 per lb of pasture as fed.

Using the actual fencing investment and pasture acres reported in our study would result in even less cost per pound of pasture as fed for fencing. The participants reported cost per acre for fencing of $42.69, or 34.2% less than the model. We did not ask for a distinction between self-constructed vs. custom installed fencing. With self-construction, costs would generally reflect only materials and supplies, whereas custom installation would include a labor cost.

Ration Costs

All but one farm reported supplementing pasture forage with stored forage as their normal procedure during the grazing season. Most reported periods in late spring and early summer when pasture growth is at its peak that they do not need to supplement forage as the pasture growth is lush and plentiful. Some choose to provide a small amount of hay, haylage, balage, or corn silage at milking time to encourage dry matter intake. Most would like to rely solely on pasture forage throughout the grazing season,

but most summers experience a short drought that all but requires supplemental feeding of forage at some point.

Ration costs were calculated using feed intake pounds times cost of each feed and do not include the costs of labor, machinery, facilities, utilities, and shrink for presenting feed to cows.

Table 5.8 displays the average feed cost per cow per day, per cwt and per pound of dry matter under each management system (pre-MIG and MIG) in each season (Summer and Winter). The average dry matter intake reported for cows prior to switching to MIG was 48 and 48.1 pounds for summer and winter rations respectively. After switching to MIG, dairy producers in the study reported dry matter intakes of 42 and 44.1 lbs respectively for summer and winter rations. While the intake appears low

Table 5.8 Various measures of feed cost for pre and post MIG summer and winter rations.

	Pre MIG Summer	**Pre MIG Winter**	**Post MIG Summer**	**Post MIG Winter**
$ per cow per day	$3.52	$3.46	$2.63	$3.25
Total DMI per cow/day (lbs)	48	48.1	42	44.1
Total ration cost/lb DM	$ .073	$ .072	$ .062	$ .074
Total ration cost/CWT milk	$ 6.50	$ 6.49	$ 5.18	$ 6.22
Seasonal total feed cost per cow[1]	$ 633.60	$ 622.80	$ 473.40	$ 585
Total yearly feed cost per cow	$ 1,256.40		$ 1,058.40	

1. Seasonal feed cost assumes 180 days confined and 180 days on pasture.

for cows in confinement prior to the switch to MIG, these cows were not high producing cows, average 17,635 lbs of milk per cow per year or 57.8 lbs per cow per day in a 305-day lactation. The National Research Council guidelines reported in the Nutrient Requirements of Dairy Cattle (2001) lists dry matter intake at 44.7 pounds per head per

day for large breed dairy cattle producing 55 pounds of milk. The reduction in dry matter intake in the winter ration after switching to MIG reflects the move toward smaller cow size through incorporation of cross-breeding and Friesian genetics. Following the switch to MIG, dairy producers reported reducing total feed costs by $198 per cow per year, ($1,256.40 - $1,058.40) a 15.8% reduction. This does not include the additional costs to confinement feeding for storage and feeding losses and the labor and machinery costs for handling feed.

PROPOSITION 4. **Michigan Intensive Grazing Dairy producers switched to MIG due to reasons other than financial.**

Hanson, Cunningham, Morehart, and Parsons (1998) reported results on a 1992 study whereby participants did not indicate that profitability was their primary reason for grazing cows. They did however indicate secondary reasons that could help improve profitability such as reduced costs (27%), less labor required (15%), and improved cow health (12%).

Study participants were asked an open-ended question about their perceptions of MIG prior to making a switch from their previous management system. (Appendix A) Results of the questions are shown in table 5.9. The responses were grouped by like responses and categorized as of a negative, positive, or neutral nature. Of the responses given to the question, 56.3% had a positive attitude while 37.5% indicated a negative response to the question and 6.25% were neutral. Only one participant felt he was very well educated about MIG before making the switch. We were interested in the relationship of positive or negative responses to the year in which participants made their switch to MIG. In other words, did the opportunity to better understand the results of a switch to MIG by other dairy producers influence their attitude of MIG before they started?

Lloyd (2007) found that while large confinement operations and managed grazing dairies both indicated a life satisfaction with realizing their potential, large confinement operators emphasized acquisition of possessions, money or status as satisfying. In other words, grazing dairies placed less emphasis on measuring satisfaction on financial merits.

Table 5.9 Initial perception of MIG system				
Grouped Response	**#**	**%**	**Pos(+) or Neg (-) Response**	**MIG start year**
Were confident because it worked for others	8	25.0	+	1996
Were ignorant of the MIG system	6	18.75	-	1993
Believed MIG was simpler or required less work	5	15.7	+	1996
Felt grazing was old technology	4	12.5	-	1994
Believed MIG would improve cow health	4	12.5	+	2001
Were cautious or skeptical that it would help	2	6.25	-	1997
Had no perception	2	6.25	Neutral	1991
Felt very educated about MIG	1	3.1	+	1995

Therefore, one could ask why a dairy farmer would make such a major switch in management systems if they were so unsure of the possible outcomes. We asked them as part of the follow-up interview why they made the decision to switch to MIG. Because responses were given after the fact, there is suspicion that answers to the question were swayed because they have been using MIG for some time. The reasons given for switching are shown in table 5.10. Participants were asked "What were your primary reasons for switching to MIG?" Participants were not limited in their number of answers. Twenty six of 29 participants reported 65 answers for an average response rate of 2.5 reasons. Improved resource efficiency included responses such as "We had access to extra acres", "We wanted to utilize the grass more", and "I wanted to increase herd size without building barns". The right-hand side of the table compares responses if re-grouped to reflect the combination of decreased costs and profit to form a financial category and combining improved lifestyle and reduced workload into a single topic. By doing so, we see that financial reasons truly did precipitate conversion to MIG, but a

Table 5.10 Factors influencing graziers reasons for switching to MIG.					
Factor	**No.**	**%**	**Factor - regrouped**	**No.**	**%**
Decreased Expense or Cost of Production	14	21.5	Financial	20	30.8
Improve Cow Health	13	20.0	Improve Cow Health	13	20.0
Improve Resource Efficiency	9	13.8	Improve Resource Efficiency	9	13.8
Improve Lifestyle	7	10.8	Improve Lifestyle or Reduce workload	14	21.5
Reduce Workload	7	10.8			
Increase Profit	6	9.2			
Other	9	13.9	Other	9	13.8
	65	100		65	100

change in lifestyle or workload as well as improving cow health were also important.

Because livestock operations are under environmental regulation and right to farm guidelines, it was possible that farms made the switch to MIG due to these issues. Study subjects were asked it their decision to switch to MIG included any considerations for environmental stewardship, neighbor relations, or right to farm issues. Over-all, twenty seven participants responded. Eleven (40.7%) reported that these issues did indeed have an impact on their decision with six citing environmental concerns and five citing neighbor relations as the primary reason. The other 16 (59.3%) farms did not feel these issues influenced their decision to switch. There was some difference in how the early and recent adopters reported. Fourteen recent adopters were split evenly with seven responding affirmatively and seven saying these issues did not have an impact on their decision. Of the early adopters, only 30.8% indicated these issues had an impact on their decision to switch to MIG.

Participants were asked about their perceptions of MIG after having been using it for a number of years. Twenty-five of the 32 (78%) responses indicated a positive attitude (Table 5.11) concerning their switch to MIG compared to 56.3% positive

responses before MIG. This is not a surprising finding as it would be expected that farmers who are successful with a management style would respond favorably to such a question.

Table 5.11 Perceptions of MIG following the switch to intensive grazing.

Grouped Response	#	Percent	Rating[1]
Very pleased with switch to MIG	16	50.0%	9.0
Experienced healthier cows	6	18.8%	9.5
Was more management than expected	6	18.8%	7.9
Other positive responses	3	9.4%	8.7
Other negative responses	1	3.1%	8.0

1 Average of how participants rated their satisfaction with their switch to MIG on a scale of 1-10 where 1 was completely dissatisfied and 10 was completely satisfied.

The other positive responses included not harvesting crops as before and netting more per acre and selling excess replacements and cows due to improved cow longevity. While the response that MIG was more management than expected is interpreted here as a negative response, those who gave that response generally had a favorable view of MIG. However, there were some differences in how participants rated their satisfaction with their switch to MIG with respect to their perceptions of MIG after having done it for a while. We asked participants in the initial interview… "**On a scale of 1 to 10 with 1 being completely dissatisfied and 10 being completely satisfied, what number would you use to describe your level of satisfaction with all aspects concerning your switch to Management Intensive Grazing?".** The rating in Table 5.11 on the right hand column shows the result. Those who reported being very pleased with their switch to MIG rated their satisfaction level an average of 9. Interestingly, those reporting improved health in the herd rated their satisfaction even higher at 9.5.

Study participants were evaluated on their satisfaction with various measures relating to lifestyle and business using a scale where 5 was very satisfied and 1 was very

unsatisfied. The respondents were very satisfied with their decision to switch to MIG as none reported that they were dissatisfied with any of the categories of lifestyle or business they were asked about. Some reported a neutral score for satisfaction. Table 5.12 displays the results of the questions about satisfaction in regard to six areas. Two of these areas were asking about lifestyle satisfaction with MIG and the other four were targeting satisfaction with financial status.

Table 5.12 Grazier satisfaction with various measures following a switch to MIG.

	Weighted Ave. Score	**Very Satisfied**			**Not Satisfied**	
		5	4	3	2	1
Time off or leisure time	3.9	3	19	7	0	0
Profitability	4.2	8	18	3	0	0
Stress or work pressure	4.0	7	14	8	0	0
Net worth or wealth status	4.0	6	17	6	0	0
Meeting business cash flows	4.0	5	20	4	0	0
Meeting personal cash flows	3.9	4	17	8	0	0

PROPOSITION 5. **MIG dairy farms are able to reduce labor requirements per cow – as measured by total hours of management and hired labor – following a switch to MIG.**

Labor costs are the second highest cash costs, trailing only purchased feed, for grazing or confinement farms. (Kreigl, 2007, Wittenberg and Wolf, 2006) Because the cattle harvest a large share of yearly forage needs themselves, fewer hours are required by grazing dairy farms to harvest feed for cows and replacements. In addition, labor required for cleaning barns and handling manure are reduced. Therefore it is logical to assume that following a switch to management intensive grazing, dairy producers would realize fewer hours of labor required to operate their dairy farms. Whether full or part-time hired labor or labor supplied by paid or unpaid family members, we expect the labor hours required per cow to decrease with a switch to MIG. Table 5.13 displays the

Table 5.13 Labor hours before and after a switch to MIG

Labor Source	# Farms	Pre-MIG	# Farms	Post-MIG
Owner/Operator (Ave. Hrs./Yr.)	26	3,100	26	2,535
Owner Spouse (Ave. Hrs./Yr.)	14	1,149	15	1,215
Other Family (Ave. Hrs./Yr.)	20	2,864	16	2,511
Hired Full Time (Ave. Hrs./Yr.)	8	3,250	9	3,379
Hire Part-Time (Ave. Hrs./Yr.)	10	1,070	18	1,307
Total Labor Hours/Farm/Yr.	26	7,333	26	6,525
Average Labor Hours/Cow/Yr.		113		98

summary of labor information from the study. Sixty one and one half percent of the farms in the study reported fewer owner/operator management hours after the switch to MIG. The other 38.5% reported no change in operator hours and no farms reported more hours for the operator after switching to MIG. Grazing dairy farm summaries support this reduced labor result from our study. Comparing the 2005 Michigan Dairy Farm

Business Summary with the 2005 Michigan Grazing Dairy Farm Business Summary, (Table 5.14) we find a reduced cost for hired labor, fewer total hours of labor and fewer

Table 5.14 Comparison of 2005 labor cost data from Michigan Dairy Business Analysis Summaries. Grazing and all farms.

	Grazing Farms	All Farms	Farms with 25-99 cows	Farms with 100-249 cows
Number of farms	11	156	40	83
Number of cows per farm	115	194	68	163
Total Labor Hours reported per farm	6,475	13,423	6,231	10,926
Total Labor Hours reported per cow	56.3	69.2	91.6	67.0
Total Hired Labor Cost per farm	$ 26,799	$ 114,100	$ 24,318	$ 75,995
Total Hired Labor Cost per cow	$ 233	$ 588	$ 358	$ 466
Unpaid hours per operator	2,693	2,929	2,912	3,073
Labor & Management Earnings – farm	$ 10,846	$ 76,300	$ 10,224	$ 64,569
Labor & Management Earnings – cow	$ 94	$ 393	$ 150	$ 396

unpaid hours per operator for grazing farms than other Michigan farms. Labor and management earnings based on market value net worth analysis shows that grazing dairy farms have lower values for the farm and per cow than all farms and lower per cow values than the small and medium sized farms in the Michigan summary. Labor and management earnings in the FINPACK program FINAN are "an estimate of your return for investing your time and management skills in the farm business." The measure is defined by equation as:

Labor & Mgt. Earnings = Average Net Worth – Interest on Farm Net Worth

Interest on Farm Net Worth is defined by equation as:

(Beginning Net Worth + Ending Net Worth) / 2 X .06

Kriegl's summary (2007) of 11-year data from grazing and confinement herds in Wisconsin reveals that paid labor cost for confinement herds per cow is significantly higher than grazing herds - $371.14 vs. $ 160.52. However, after adding a charge for unpaid labor and management ($ 483.82 for grazing, $ 303.39 for confinement) to the total labor cost, the difference becomes much smaller on a per cow basis - $674.53 (confinement) vs. $ 644.34 (grazing). These data seem to conclude that even though the grazing farms pay less for hired labor, when including a cost for unpaid owner labor and management, the efficiency of labor expense decreases significantly even though it is still competitive with non-grazing dairy farms. While grazing dairy farms can feel good about the lower cost of labor and management for their operation, perhaps there is room for improvement in considering earnings generated with the labor currently invested in the farm.

Outsourcing

An additional reason for less labor requirement following their switch to MIG was the acceptance of more outsourcing of various farm tasks, most of them related to field crop operations. Only one early adopter of MIG outsourced any farming operations prior to switching to MIG while four recent adopters enlisted custom operators for eight farm operations pre-MIG. These levels changed after MIG implementation as three early adopters outsourced six operations and ten recent adopters outsourced 19 farm tasks. The tasks most often outsourced included combining and large package hay baling. It appears that one way recent adopters to MIG have reduced labor is by hiring certain jobs done by custom operators.

PROPOSITION 6. **Dairy farms that switch to MIG experience improved cow health.**

Study participants were asked questions relating to herd health. During the interview portion of the data collection, participants were asked to list up to three herd health concerns they had pre MIG and then post MIG. They were asked to list the major concern first followed by lesser concerns. Participants did not have to provide an answer. In addition, they were asked about management challenges pre and post MIG. They were to list up to three of the most significant management problems they were experiencing on the farm before the switch to MIG and after. Tables 5.15 and 5.16 provide results of these questions. For the herd health issues, twenty-seven participants could rank up to three responses, creating a total of 81 potential responses. For pre MIG there were 45 responses given and six of those were "none". Once a participant responded with "none" the other two potential ranked responses were cancelled, thus reducing the potential response number. Taking this into consideration, the pre responses totaled 45 of a potential 69 answers or 65.2%. The post responses totaled 26 of a potential 53 answers or 49.1%. Thus we have a true 16.1% reduction in the response rate to health concerns after the farms switched to MIG. It is also striking to note the improvement of feet and

Table 5.15 Herd health concerns of dairy farms pre and post a switch to MIG.

Herd Health Concern	Pre	Post
Feet and leg related problems - % responded	40.7	11.1
Metabolic disease - % responded	40.7	3.7
Mastitis - % responded	25.9	18.5
Reproduction problems - % responded	18.5	0.0
Disease, other than metabolic - % responded	11.1	0.0
Other - % responded	7.4	11.1
No Health Concerns	22.2	51.9

leg problems and metabolic disease problems pre to post. Also of interest is the mastitis response rate. Of the five participants who identified mastitis as a concern post MIG switch, three did not identify it as a problem concern pre MIG and the other two increased the ranking of mastitis as a health concern when other concerns were eliminated.

It could be argued that the method used to evaluate the herd health status of these farms – through a ranking– does not necessarily identify all of the potential health problems encountered by the farms. Asking participants to identify and rank issues gives opportunity for some issues to be neglected. A rating system, where all health issues are identified and then rated using a scale, such as 1 to 5, would place an actual rating on each health concern. Ranking does not show the degree of separation between identified health concerns. Nonetheless, the open ended nature of the questions about health concerns allowed the producers to respond on the health issues that were the most prevalent pre and post MIG as well as 2005.

Additional evidence for improved herd health is found in the detail of expenses of Michigan dairy farms in 2005. Wittenberg and Wolf (2006) report that Michigan dairy farms in the business analysis summary spent $100.72 per cow on veterinary costs in 2005 and the Michigan grazing dairy farms spent $47.99 per cow.

Table 5.16 contains the results of a different question from study participants. When asked what their major three management problems were before and after a switch to MIG, several responses were health related. This question on management problems was asked before the question about herd health issues. The number of responses to the

Table 5.16 Responses to management problems pre and post MIG.

		# of responses	
Specific response	**Category**	**Pre**	**Post**
Feet/Leg Problems		7	1
Metabolic Disease		6	1
Mastitis		6	4
Animal Health		1	0
General Disease		1	0
General Herd Health		1	0
	Herd Health	**22**	**6**
Wasting Pasture		1	0
Forage Quality		1	1
Feed Intake Management		2	10
Pasture Production		0	1
Feed Volume		3	0
	Feed Management	**7**	**12**
Breeding Problems		4	4
Heat Detection		2	1
	Breeding Management	**6**	**5**
Feed Cost of Production		1	0
Milk Cost of Production		2	1
	Production Costs	**3**	**1**
Cow Comfort		5	3
Weather Problems		0	3
Hired Labor Issues		3	0
No Management Problems		3	3
Other		4[1]	8[2]

1. Other includes: cow longevity, manure handling, and general management
2. Other includes: cow longevity, general management, water management, pasture weed control, fly control, fresh cows, and milk production.

management question was more numerous than the health question. The table shows the initial responses and how they were grouped into generalized categories. The change in feet and leg problems was examined closer due in part to anecdotal information that

grazing herds have fewer feet and leg problems. Participants were asked more detail about feet and leg performance of their herd before and after the switch to MIG. One question asked participants to rate the condition of feet and legs prior to switching to MIG using the scale of one to five where five was excellent and one was poor. The average rating before MIG was 2.6 while the average after switching to MIG was 4.2. In addition, participants were asked about the frequency of hoof trimmer visits to the farm. Participants reported an average of 2.6 hoof trimmer visits to the farm prior to their switch to MIG and only 1.6 hoof trimmer visits to the farm after their switch. Lastly, study subjects were asked to report the number of cows that left the farm due to feet and leg problems. Before switching to MIG, 5.1 cows per year, representing 6% of the average herd, left the farm. After the switch to MIG, 3.2 cows (2.8% of the herd) left the average farm for feet and leg problems.

These results indicate that after the switch to MIG, these dairy producers had a significant shift away from worrying about herd health related issues. They reported this shift both as a management issue and specifically as a herd health issue. Prior to switching to MIG the study participants were concerned with herd health issues, specifically feet and leg problems, metabolic disease, and mastitis. Of these, only mastitis remains a herd health concern. These farms also were concerned with labor management, feed procurement and the cost of feed production, making cows comfortable, and getting cows bred. Following the switch to MIG, their focus of concern remained on mastitis and breeding programs. A large shift toward feed intake management took place as many participants identified pasture forage as a critical management aspect of MIG.

The responses to the questions posed about management and herd health concerns before and after a switch to MIG indicate that these dairy producers believe they have less herd health problems now that they are on MIG. We measured their perceptions of before and after situations. Their general over-all satisfaction with MIG could be impacting their responses as they would tend to answer to the positive when asked about the impact of a favorable system would have on management issues. To more fully answer this proposition, reporting actual incidence of herd health events would be more valuable.

Chapter 6. Summary and Conclusions

While project results were limited due to the difficulty in achieving substantial financial data, our findings combined with those of previous researchers have shown that MIG has allowed dairy producers to grow their net worth and meet or exceed required cash flow. While MIG dairy producers may not achieve the milk production level per cow of some confinement operations, they have found that minimizing input costs – particularly feed and labor – adequately compensate for the lower production. In our results, we found little difference in the milk production of these herds following the switch to MIG. These herds were either not able to achieve or chose not to strive for high production per cow neither before nor after switching to MIG. The switch to MIG resulted in a significant change in the cost to produce milk when measured per hundredweight. This allowed these farms to pay down debt, make improvements, increase net farm income, improve net worth, and placed them in a similar or better position financially than they had been previously.

The reduction in daily feed cost to the milking cows following the switch to MIG was a significant change. The summer daily ration cost per cow per day was significantly lower for the average herd. There was much less difference in daily feed cost when comparing the winter rations before and after the switch to MIG and there was very little difference between the pre-MIG summer and winter rations. This is expected as most of the herds were confinement herds prior to their switch to MIG and would have fed very similar rations in the summer and winter. While cost per cow per day is important, cost per hundredweight of milk is a better comparison as it allows for the effect of the change

to grazing and its impact on production to be considered in the comparison. Participants in this study reduced daily feed cost per hundredweight of milk by 20.3% during the grazing season following the switch to MIG.

There is little doubt that during the 10 to 15 years prior to 2005 there was an increase in the use of pasture as a primary summer forage for dairy cattle. With the increased use of intensive rotational grazing systems and improved management of these systems, some dairy farmers have found MIG a fulfilling alternative to non-intensive grazing management.

Our research intended to determine whether these dairy producers who had made the switch to MIG were better off financially than they were prior to switching to MIG and what principles and practices did they employ to make this change.

The results uphold the findings of previous studies that found MIG dairy producers have proven to be a competitive option for some dairy producers. These farms are not competitive to the point of out-performing large confinement operations, but rather being competitive on a level of satisfaction with their success. Grazing dairy producers report a level of satisfaction with their farming operation and lifestyle that is as good or better than their non-intensive grazing and confinement counterparts in the industry. It is recognized that this project examined a limited number of grazing farms that were willing participants at least in part because they have found success with MIG. Farmers that were not successful would likely be less willing to participate in a research project that aimed to investigate their financial position. In the initial process of locating MIG dairy farms for this project, farmers, Extension Agents, and other industry representatives were asked to identify farms that had attempted to incorporate MIG on

their farm, but gave it up after a time. We found one farm but the producer was not willing to participate in our project. This is not meant to imply that those who switch to MIG are guaranteed success. Nor is it an attempt to say there are no unsatisfied dairy producers who switched to MIG. Using the contacts we encountered during our search for MIG dairy farms, few of these contacts could provide names of dairy producers who tried MIG and either quit dairy farming, or gave up MIG.

Participants in this project concentrate on milking cows and not producing large volumes of row crops or excess forage for resale. Their forte' – and yet self-proclaimed biggest challenge – is balancing the fine line of providing high quality pasture forage in the right amounts to the right group of cows at the right time. These MIG dairy farmers built cow numbers and not acres as they switched from confinement or non-intensive grazing to MIG.

The switch to MIG was for most participants a work in progress. Most reported taking at least two years – some reported more years – to fully implement a switch to MIG. Some started the experiment first with replacements then added the milking cows while others started with the milking herd. They grew into MIG slowly, some after extensive study and investigation. There was not a large re-investment in the pasture system as these producers reported less than $130.00 per cow investment in fencing, water systems, and equipment. The data presented showed that these farms had just 9% of their farmed acres in pasture prior to switching to MIG. Following the switch, the pasture acres increased quickly to 22% and by 2005 represented 28% of total acres farmed. These farmers reduced their total acres per cow by 19% while increasing acres of pasture per cow by 145%.

The switch away from row crop production has resulted in savings in labor as cows perform a significant portion of the forage harvesting and manure spreading during the grazing season. Through careful management and pasture species selection, these farmers have developed methods to make the fullest use of the full grazing season, including incorporation of annual crops for summer slump and extending the fall season.

Study participants included an equal number of farms that reported no grazing experience prior to switching to MIG and those with several years of non-intensive grazing. Neither recent nor early adopters of MIG were of one prior management style, thereby indicating no apparent advantage to having pastured cows previously and no disadvantage to being in total confinement prior to switching to MIG.

The methods employed in the conversion to MIG began with education for most of the participants in the study. They reported heavy reliance on other grazers and Extension professionals for the information they felt they needed to begin MIG. More recent adopters gave seeing the success of others as a reason for why they decided to try MIG. Dairy producers contemplating MIG today have a significant advantage in the availability of information about MIG. Through other farmers, Extension, USDA grazing specialists, and publications devoted specifically to intensive grazing systems, there are a multitude of resources for information on MIG. Virtually all of it is available today on the internet. These resources can greatly reduce the length of the learning curve for dairy producers contemplating a switch to MIG thereby reducing the timetable in realizing the benefits of MIG that have been reported. Dairy producers considering MIG should take full advantage of government programs such as Environmental Quality Incentive

Program (EQIP) to assist them with start-up grazing costs for fencing, land improvements (seeding), and water systems.

Many questions still remain regarding MIG dairy operations, such as where is the optimal or most efficient level of reducing inputs to reduce cost of production. What measure of efficiency is best applied to MIG dairy farms? Is it profit per acre? Profit per cow? Is it tied to the efficiency of labor? Is minimal concentrate feeding the ultimate for MIG operations or is there profit to be gained when the milk to concentrate ratio gets favorable for milk production? Nott (2003) summarized one of his recommendations for future directions for MIG research this way. "The use of MIG should be monitored by state and federal statistical services. We need to know the numbers of farms involved and the level of output. Annual economic results of graziers need to be pooled, published, and monitored. These will allow policy makers to make better decisions about how to allocate support among research and outreach educational activities." The information presented here is the result of case study examination into the history of these participating MIG dairy farms. The data gathered and summarized was done so accurately and completely. For future research to be valuable in making assessment about MIG dairy farms, farmers must maintain accurate and complete financial and production records to better evaluate their own management as well as potentially provide data for research purposes from which others can benefit.

APPENDIX A

METHODS OF CHANGE AND FINANCIAL PERFORMANCE OF DAIRY FARMS BEFORE AND AFTER A SWITCH TO MANAGEMENT INTENSIVE GRAZING (MIG)

INITIAL TELEPHONE INTERVIEW

For the completion of

A MASTERS DEGREE RESEARCH PROJECT

by

PHILIP E. TAYLOR
GRADUATE STUDENT AND EXTENSION EDUCATOR

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS

Participant ID# _____

METHODS OF CHANGE AND FINANCIAL PERFORMANCE OF DAIRY FARMS BEFORE AND AFTER A SWITCH TO MANAGEMENT INTENSIVE GRAZING

Initial Phone Interview Script

Participant ID # _____

Hello,

My name is Phil Taylor. I am a graduate student working on a Masters Thesis in the Department of Agricultural Economics at Michigan State University. I am also an Extension Educator with Michigan State University Extension working in the areas of Dairy and Farm Management.

I am calling to ask you some questions about your dairy operation. Your name was provided to me by a university Extension Educator or other person working in the dairy industry with some ties to grazing management.

My research project is examining the financial aspects and methods of change of dairy farms that made a switch to Management Intensive Grazing during the last 15 years or so.

This study has two objectives:

1. Report on the financial performance of grazing dairy farms prior to and after making a switch to MIG and also measure financial performance in 2005 to investigate financial changes of the dairy business in the longer term since switching to MIG.
2. Develop a set of guidelines to help direct non-grazing dairy farmers and start-up dairy farmers interested in MIG toward a successful grazing dairy business.

There are benefits to participating in the project. First, as a participant in the study you will receive a copy of any professional journal articles, bulletins, or research articles that are developed from this study. This will allow you to compare your farm with others in the study. In addition, your input will be helpful to dairy farmers who are making decisions about whether grazing could be a good strategy for them. Persons interested in starting a dairy farm could also benefit by the knowledge made available from this project. The result will be a stronger, more knowledgeable, and more financially stable grazing segment of the greater dairy industry.

_____ (name) I must be up front with you and let you know that the participants in the study will be asked to take approximately 3 to 4 hours of their time to answer questions through phone interviews and a written questionnaire. This interview will require about 15 minutes, the written questionnaire will take 2 to 3 hours, and the follow-up phone interview will require about 45 minutes.

Participation in this process is completely voluntary. You may choose not to answer a question or not to participate in the project at any time without penalty or consequence. You are also encouraged to ask questions or raise concerns about the study at any time.

Would you be willing to be a participant in this research project?
YES NO

If yes, …

Would you be willing to answer 10 short questions about your dairy operation that will take approximately 10 minutes? YES NO

If yes, is now a good time to go through the questions or should I call back at another time more appropriate?

Thank you for agreeing to answer some questions. I want you to know that all questions, whether interview or written, are optional. You are not required to answer. The first thing I need to ask is for your permission to use the responses you provide as part of the case study research project I am working on. Your answers will be held in confidence and only I and my research committee of MSU professors will have access to your responses. When writing the thesis and research reports, only summarized responses will be reported and no individual responses will be identified.

Will you permit me to use your responses for the purposes of this research?

If yes, thank you for agreeing to provide information for this project. I greatly appreciate it.

Just one final question before I begin: Will you allow me to record your answers over the phone using an audio tape recorder? The purpose of recording your responses is to be sure I fully acknowledge your responses, and also to speed up the process of gathering data over the telephone. The recorded responses reduce the amount of time I would need to write down all that you have to say. The information you record on audio tape will also only be available to me and my guidance committee. I will record the audio tape in such a way that your identity will not be recorded on the tape, only a number that associates your tape to your farm information. May I have your permission to audio tape your responses?

YES; Thank you. I am starting the tape recording now.

Next question.

1. Are you currently producing milk on your dairy farm? YES NO

2. During the grazing season, do you utilize a Management Intensive Grazing system on your farm? YES NO

DEFINITION: Management Intensive Grazing is defined as moving dairy cattle to new pasture paddocks every 3 days or less. Most intensive grazers move their cattle more frequently, some after each milking.

3. The next question has three parts. First, …

a. What year did you begin to use MIG? _____

b. How many years did it take to fully convert to MIG? _____

c. Therefore, the 2 years prior to your use of MIG would be _____ & _____, and the first 2 years after switching to MIG would be _____ & _____ .

4. What management system were you employing with your milking cows prior to switching to MIG? Were you using… Confinement
Non-intensive Grazing?

5. On a scale of 1 to 10 with 1 being completely dissatisfied and 10 being completely satisfied, what number would you use to describe your level of satisfaction with all aspects concerning your switch to Management Intensive Grazing? _____

Comments?

_____

_____

_____

6. What were your perceptions of MIG before you started?

_____

_____

7. What are your perceptions of MIG now that you have been using this management system?

_____

_____

_____

This phone interview is just the first part of my research project. I desire to understand more about the financial and management practices of grazing dairy farms prior to and after their switch to MIG. I have developed a questionnaire and a second phone interview in order to gather more detailed information about the dairy farms that participate in this study.

8. The questionnaire will take approximately 2 to 3 hours to complete. It asks detailed questions about the financial status of your farm and management practices in the two years prior to switching to MIG, the two years after making the switch, and the year 2005. Would you be willing to participate in answering further questions about your dairy management prior to and after switching to management intensive grazing?

YES **NO**

If yes, confirm contact information.

Let me be sure that I have your contact information correct:

Who will be the primary contact person for the information? _____

Farm Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Is the phone number I used to contact you the best number to call? YES NO

If no, new phone #: _____

What is the best time of day to contact you? _____ AM PM

Do you have an email address that you would provide for me to use as a contact?

Email _____

_____(name), I have two more questions at this time.

9. Please answer the next question with yes, most likely, not likely, or no. If before starting MIG you knew what you know now about using MIG, would you still have made the switch to MIG?

Yes **Most Likely** **Not Likely** **No**

10. Do you know other grazing dairy producers that I could talk with about participating in this research project?

If yes, would you give me their names and the city where they live?

Name	Location
_____	_____
_____	_____
_____	_____

_____(name), thank you for your time and for providing the information. I will be mailing you the project data questionnaire in the next couple of days. Please fill it out as soon as possible. I will call you a week to 10 days after I mail the survey to be sure you received it and ask you about your progress.

Have a good day/evening.

APPENDIX B

METHODS OF CHANGE AND FINANCIAL PERFORMANCE OF DAIRY FARMS BEFORE AND AFTER A SWITCH TO MANAGEMENT INTENSIVE GRAZING (MIG)

DATA QUESTIONNAIRE

for the completion of

A MASTERS DEGREE RESEARCH PROJECT

by

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GRADUATE STUDENT AND EXTENSION EDUCATOR

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS

Participant ID# _____

METHODS OF CHANGE AND FINANCIAL PERFORMANCE OF DAIRY FARMS BEFORE AND AFTER A SWITCH TO MANAGEMENT INTENSIVE GRAZING (MIG)

Data Questionnaire

Section A: General Farm Questions:

1. What year did you begin management level dairy farming? (significant decision making) _____

What year did you begin management level dairy farming at your current location? _____

What year did you begin grazing (intensive or not) management? _____

2. Pre Management Intensive Grazing (MIG) refers to the average of the two years prior to switching to MIG. Post MIG refers to the average of the two years after completing a switch to MIG. If zero, please enter "0".

Item		Pre MIG	Post MIG	2005
Herd Size (# of milking cows)				
# of Dry Cows				
# of Replacement Heifers				
# of Dairy Steers				
# of Beef Cows				
# of Beef Steers				
Acres of Pasture (some might be used for hay crop)				
Acres of Annual Pasture Crop – (sm. grain, brassicas)				
Acres of Permanent Pasture (not used for hay crop)	*			
Acres of Legumes for Hay or Haylage	*			
Acres of Corn Silage	*			
Acres of Grass Forage for Hay or Haylage	*			
Acres of Corn for Grain	*			
Acres of Soybeans	*			
Acres of Wheat or other winter small grain	*			
Acres of Spring small grain	*			
Acres of other crops _____	*			
Total Acres Farmed (should equal the sum of * items)				
Total Crop Acres Owned				
Total Crop Acres Rented				
Average Rental Rate ($/Acre) of Crop Acres				
Total Pasture Acres Owned				
Total Pasture Acres Rented				
Average Rental Rate ($/Acre) of Pasture Acres				

3. For pre and post MIG, please describe the breed of cows you had/have and what percent of the herd was/is made up of that breed? If crossbred, list the breeds in the cross.

Pre-MIG

Purebreds

Breed of cows	% of herd

Crossbreds

Cross Breed 1	% of cross	Cross Breed 2	% of cross	% of herd

Post-MIG

Purebreds

Breed of cows	% of herd

Crossbreds

Cross Breed 1	% of cross	Cross Breed 2	% of cross	% of herd

Comments:

_____

_____

4. This question has two parts. The first part is to list, in your opinion, the key skills a dairy producer must acquire to be a successful grazier. The second part is to use the box on the left to rank the skills with "1" being the most important skill, "2" the next most important, and so on until each skill has been ranked.

☐_____

☐_____

☐_____

☐_____

☐_____

☐_____

Section B: Satisfaction and the Future

1. To what degree do you feel satisfied with your switch to MIG with respect to the following areas? Please circle the number that best represents your satisfaction level for each item.

	Very Satisfied	Satisfied	Neutral	Unsatisfied	Very Unsatisfied
Time off or leisure time	5	4	3	2	1
Profitability	5	4	3	2	1
Stress or Work Pressure	5	4	3	2	1
Net worth or wealth status	5	4	3	2	1
Meeting business cash flows	5	4	3	2	1
Meeting personal cash flows	5	4	3	2	1
Other: _____	5	4	3	2	1
Other: _____	5	4	3	2	1

2. If you are unsatisfied or very unsatisfied with any of the areas listed, what are the reasons for being dissatisfied?_____

_____

_____

3. How many years do you intend to continue dairy farming? _____ years

4. Do you have someone preparing to take over the operation of your dairy farm?
YES NO
If YES, who? (please check only one)

___ **Child/Children**	___ **Grandchild/Children**	___ **Friend**
___ **Employee**	___ **Nephew/Niece (extended family)**	___ **Other:**

_____

Section C: Financial Management Questions

1. <u>BALANCE SHEETS (Cost Basis)</u> : Please complete the following table by inserting the cost value from your balance sheet (farm only) for each line item or return copies of detailed balance sheets for each year. Please use a current cost value (what was paid for the asset less depreciation taken) for each line. If unknown, please write UNKN in the box. If zero, then enter "0". Each box therefore, should be completed. Please use cost values as of December 31 for each year.

<u>Balance Sheet Information (Farm Only) as of December 31.</u>

<u>Balance Sheet Item (Farm Only !)</u>	**Pre Yr 2**	**Pre Yr 1**	**Post Yr 1**	**Post Yr 2**	**2005**
Insert actual year >>>>>					
<u>ASSETS:</u>					
Total Current Farm Assets					
Total Intermediate Farm Assets					
Total Long Term Farm Assets					

2. <u>BALANCE SHEETS (Market Basis)</u> : Please complete the following table by inserting the market value (what the asset was worth on December 31st of the year in question) from your balance sheet (farm only) for each line item or return copies of detailed balance sheets for each year. If unknown, please write UNKN in the box. If zero, then enter "0". Each box therefore, should be completed. Please use market values as of December 31 for each year.

<u>Balance Sheet Information (Farm Only) as of December 31.</u>

<u>Balance Sheet Item (Farm Only !)</u>	**Pre Yr2**	**Pre Yr1**	**Post Yr 1**	**Post Yr 2**	**2005**
Insert actual year >>>>>					
<u>ASSETS:</u>					
Total Current Farm Assets					
Total Intermediate Farm Assets					
Total Long Term Farm Assets					
<u>LIABILITIES:</u>					
Total Current Farm Liabilities					
Total Intermediate Farm Liab.					
Long Term Farm Liabilities					

3. <u>INCOME STATEMENTS</u>: The following table summarizes income statements from five years. Please complete as accurately as possible or provide copies of actual income statements. To help simplify the process, the values are numbered according to the Schedule F Tax form, so values could be found easily on Federal Tax Returns for the given years. NOTE: This form is an abbreviated income statement. Not all income nor expense information is requested. Therefore, total receipts and expenses will not equal the sum of the items listed.

Sch F	**Income Statement (Sched. F Categories)**	Pre Yr 2	Pre Yr 1	Post Yr 1	Post Yr 2	2005
	Insert actual year >>>>>					
<u>Line</u>	**<u>RECEIPTS</u>**	*******	*******	*******	*******	*******
4	Milk Sales					
4	Crop Sales					
6	Government Programs					
	Total Farm Receipts of all income sources on Schedule F, not just the three items listed above.					
		*******	*******	*******	*******	*******

	SELECT OPERATING EXPENSES	*******	*******	*******	*******	*******
16	Depreciation and Section 179					
18	Feed Purchased					
23	Interest					
24	Hired Labor					
27	Repairs					
	Total Operating Expenses of all items on Schedule F, not just the five items listed above.					
		*******	*******	*******	*******	*******

4. Non-Schedule F income and expenses. Please complete the following table dealing with non-schedule F income and expenses. If zero, please enter "0".

Income Statement	Pre Yr 2	Pre Yr 1	Post Yr 1	Post Yr 2	2005
Insert actual year >>>>>					
RECEIPTS	*******	*******	*******	*******	******
Dairy Cattle Sold – Calves, Heifers and Cows - Cull or for Dairy Purposes					
Sales of capital items other than livestock					
New Borrowed Funds					
EXPENDITURES	*******	*******	*******	*******	******
Principle Paid on all farm loans					
New Capital Purchases					
Federal and State Income Taxes					

5. Please complete the following table on milk price and components of the milk shipped prior to and after your change to MIG.

	Pre Yr 2	**Pre Yr 1**	**Post Yr 1**	**Post Yr 2**	**2005**
Ave. Milk price per cwt. all milk shipped					
OR					
Total lbs of milk shipped					
Average Milk fat % on milk shipped					
Average Protein % on milk shipped					
Ave. Somatic Cell Count on milk shipped					

6. The following questions deal with capital investments purchased or sold as part of the switch to MIG. Please complete to the best of your ability. If more room is needed, use the back of the page.

What were new investments you made when making the switch to MIG? Please report the initial investment amount, and if you borrowed funds to make the purchase?

Item	**Cost**	**Funds Borrowed?**
_____	$ _____	Y N
_____	$ _____	Y N
_____	$ _____	Y N
_____	$ _____	Y N
_____	$ _____	Y N
_____	$ _____	Y N

Did you sell capital items when switching to grazing? (please circle one) YES NO

If yes, what items of capital did you sell when the change was made to MIG and what was the level of income from each sale?

Item	**Income**
_____	$ _____
_____	$ _____
_____	$ _____
_____	$ _____
_____	$ _____
_____	$ _____

7. When you switched to MIG, did you apply for any grants or assistance from government sources or other industry groups?

YES **NO (go to section E)**

If yes, please list the agency, the year, the purpose for the funding, and the grant or cost share amount you received if your application was accepted. Please list the funding source you applied for even if you did not receive funding.

Agency	Year	Purpose	$ Value Requested	$ Value Received
Example: NRCS - EQIP	2002	Fencing, water system	$10,000	$7,000

Section D: Human Resource Management

1. Please complete the following table concerning workers on your dairy farm. This table should include family paid and unpaid members as well as all hired workers. Please include the yearly stipend or total compensation for paid employees. The sample farm owner shown is a full time worker and is considered an unpaid family member. The farmer's teenage son works about 1 hour per day on average and is considered a part-time paid family worker. The owner's spouse is the bookkeeper, go-for, feeds calves, and helps fill out surveys. The spouse works about 10 hours per week.

Worker	Hours/Year Pre-MIG	Hours/Year Post-MIG	Full Time	Part Time	Family Paid	Family Unpaid	* Yearly Stipend
Sample Farm Owner	3000	2600	X			X	
Farm Owner's Son	350	350		X	X		$2,800
Farm Owner's Spouse	520	520		X		X	
Owner							

*** The yearly stipend includes cash, benefit value, and non-cash compensation such as housing or vehicle usage.**

2. Do workers on your farm and their families have health care coverage? If yes, who – meaning which member of the family - is providing the health care? If no, what is the reason for the lack of health care coverage?

Worker	**Health Coverage**	**If Yes, provided through whom?**	**If No, what is the reason for no coverage?**
Sole Proprietor	**YES NO**		
Sole Proprietor Spouse	**YES NO**		
Sole Proprietor Children	**YES NO**		
First Partner	**YES NO**		
First Partner Spouse	**YES NO**		
First Partner Children	**YES NO**		
2nd Partner	**YES NO**		
2nd Partner Spouse	**YES NO**		
2nd Partner Children	**YES NO**		
Full Time Hired Employees	**YES NO**		
Part Time Hired Employees	**YES NO**		
	YES NO		
	YES NO		
	YES NO		

In 2005, how much did the farm pay for self employed health insurance? $ _____

In 2005, how much did the farm pay for employee health insurance? $ _____

In 2005, did you carry workers compensation insurance? YES NO
If yes, what was the annual premium for the insurance? $ _____

Comments:

_____

_____

_____

3. The following questions deal with non-farm income information.

a. How much draw from the farm and non-farm income did the Sole Proprietor or 1st Partner receive in each year? If zero, please enter "0".

	Pre Yr 2	Pre Yr 1	Post Yr 1	Post Yr 2	2005
Draw from farm					
Non-Farm Income					

b. Question 3 Continued. How much farm wage and non-farm income was received by the spouse of the Sole Proprietor or 1st Partner? If zero, please enter "0".

	Pre Yr 2	Pre Yr 1	Post Yr 1	Post Yr 2	2005
Farm Wage					
Non-Farm Income					

c. Is the farm a sole-proprietorship? YES NOIf yes, skip to section E.

If no, please complete the following sections for a 2nd and 3rd partner. If more room is needed, please use the back of the page.

d. How much draw from the farm and non-farm income did the 2nd Partner receive in each year?

	Pre Yr 2	Pre Yr 1	Post Yr 1	Post Yr 2	2005
Draw from farm					
Non-Farm Income					

e. How much farm wage and non-farm income was received by the spouse of 2nd Partner?

	Pre Yr 2	Pre Yr 1	Post Yr 1	Post Yr 2	2005
Farm Wage					
Non-Farm Income					

f. How much draw from the farm and non-farm income did the 3rd Partner receive in each year?

	Pre Yr 2	Pre Yr 1	Post Yr 1	Post Yr 2	2005
Draw from farm					

Non-Farm Income					

g. How much farm wage and non-farm income was received by the spouse of 3rd Partner?

	Pre Yr 2	Pre Yr 1	Post Yr 1	Post Yr 2	2005
Farm Wage					
Non-Farm Income					

Section E: Knowledge and Training

1. Please indicate the highest level of education of the primary farm operator. Please select from the choices below the option that best describes the level of education. Please select only <u>one</u>.

____ Grade School
____ Some High School
____ High School Graduate
____ 2 Yr. College Graduate – Associates Degree
____ 4 Yr. College Graduate – Bachelor Degree
____ Masters Degree
____ Ph. D. Degree

2. Have you attended educational events, such as seminars, conferences, workshops, field days, etc. to increase your skills in dairy farm or grazing management? (please circle) YES NO

If NO, go to question 3

If yes, please place an "X" on the lines below that best represent your participation in educational events related to dairy or grazing management put on by government, industry, or university organizations and businesses.

	*<u># of education events you attended per year *</u>			
	None	1 or 2	3 to 5	6 or more
All events in the 2 years prior to the switch to MIG*	_____	_____	_____	_____
Grazing events in the 2 years prior to the switch to MIG	_____	_____	_____	_____
All events in the 2 years after the switch to MIG	_____	_____	_____	_____
Grazing events in the 2 years after the switch to MIG	_____	_____	_____	_____
All events attended in 2005	_____	_____	_____	_____
Grazing events attended in 2005	_____	_____	_____	_____

* All events include the grazing events.

3. Do you subscribe to Dairy Management or Grazing Management publications? YES NO

If yes, please list publications below and approximately how long you have subscribed. If no, please go to the next question.

Publication	Years	Publication	Years
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____

4. What are your primary sources of farm information and grazing information. Please rank the following choices from most relied on source (1) to least relied on source. If you do not receive information from the source listed, leave it blank. If you have other sources, please describe them and rank them. Please be sure to rank the sources for both general farm information (left column) and grazing information (right column).

General Farming Information	Source	Grazing Information
	General Farm Magazines (Farm Journal, Successful Farming, etc)	
	Dairy Magazines (Hoards Dairyman, Dairy Herd Management, etc.)	
	Grazing Magazines (Graze, Grazier, Forage Grower, etc.)	
	Extension materials (Bulletins, Newsletters, Web sites, etc.)	
	Extension programs (Seminars, Conferences, Pasture Walks, etc.)	
	Industry programs (Seminars, Conferences, etc.)	
	Industry materials (Bulletins, Newsletters, Web sites, etc.)	
	Other Farmers or Graziers	
	Other:	
	Other:	
	Other:	

Section F: Herd Management Questions

1. Please complete the following table to the best of your ability. Please count only instances with the milking herd and dairy replacements. If zero, please use "0". If unknown, please record "unkn".

	Herd Health & Reproduction Criteria	**2 Yr Pre**	**1 Yr Pre**	**1 Yr Post**	**2 Yr Post**	**2005**
a	How many cows left the herd? (Indicate actual number)					
b	How many cows died? (actual number)					
c	How many heifers and calves died?					
d	Still Born Calves					
e	Clinical Mastitis Cases per month – antibiotic treatment					
f	Clinical Mastitis Cases per month – non antibiotic treatment					
g	Average Services per Pregnancy					
h	Average Days Open					
i	Calving Interval					
	Incidence of Metabolic Disorders (actual number)	*******	*******	*******	*******	******
j	Milk Fever					
k	Ketosis					
l	Displaced Abomasum					

2. Feed Ration Information

Please complete the following ration information section. Please complete the cost of each ingredient on an As Fed basis per pound. Because summer and winter rations are considerably different for grazing herds, please itemize each feed ingredient by the season. The summer ration is a typical ration fed during the summer months or grazing season. The winter ration is a typical ration fed during the fall and winter. Please report the lbs fed per cow per day for the rations fed prior to and after switching to MIG.

Ration Ingredient (lbs per day as fed)	$/lb As Fed	Pre MIG Summer	Pre MIG Winter	Post Summer	Post Winter
Corn Silage					
Haylage, Legume					
Haylage, Grass/Small Grain					
Dry Hay, Legume					
Dry Hay, Grass/Small Grain					
Pasture					
Corn Grain					
Soybean Meal					
Protein Supplement					
By-product feed					
By-product feed					
Vitamin/Mineral Premix					
Other Feed _____					
Other Feed _____					
Other Feed _____					

3. Feeding Management

	Ration and Feeding Questions	**2 Yr Pre**	**1 Yr Pre**	**1 Yr Post**	**2 Yr Post**	**2005**
a	How many bushels of corn were purchased in each year?					
b	How many hours per day were cows without feed?					
c	How many hours per day were cows without water?					
d	What were corn grain yields in bushels per acre for each year? **If none was raised, enter 0.**					
E	What were corn silage yields in tons per acre as fed for each year? **If none was raised, enter 0.**					
f	What were hay crop yields in tons of dry hay equivalents per acre?					
g	What were pasture crop yields in tons of dry matter per acre?					

4. Is a Total Mixed Ration used for supplemental feed during the grazing season and for Fall and Winter feeding? YES NO

Comments:

_____

Comments:

_____

_____

This completes the written questionnaire portion of the research project.
Thank you for completing this questionnaire.
Your participation in this project is very much appreciated.

APPENDIX C

METHODS OF CHANGE AND FINANCIAL PERFORMANCE OF DAIRY FARMS BEFORE AND AFTER A SWITCH TO MANAGEMENT INTENSIVE GRAZING (MIG)

TELEPHONE INTERVIEW

for the completion of

A MASTERS DEGREE RESEARCH PROJECT

by

PHILIP E. TAYLOR
GRADUATE STUDENT AND EXTENSION EDUCATOR

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS

Participant ID# _____

METHODS OF CHANGE AND FINANCIAL PERFORMANCE OF DAIRY FARMS BEFORE AND AFTER A SWITCH TO MANAGEMENT INTENSIVE GRAZING (MIG)

Hello _____ (name),

This is Phil Taylor calling from Michigan State University again. I would like to ask you more questions about your dairy farm. The interview will take about 45 minutes. Is this a good time or should I call back at a more convenient time for you? NO - Schedule a different time _____

YES, then "Thank you. I want to remind you that by signing and returning the consent to participate in research form, you gave me permission to audio tape your responses and use your information in the research project. Remember that participation in this interview is completely voluntary. You may refuse to answer a question or you may discontinue your participation in this project at any time without penalty or consequence. Also, if you have any questions or concerns about the project at any time, please ask.

We are ready to begin, I will start the tape recorder now.

METHODS OF CHANGE AND FINANCIAL PERFORMANCE OF DAIRY FARMS BEFORE AND AFTER A SWITCH TO MANAGEMENT INTENSIVE GRAZING (MIG)

Interview Questions

Date: _____ Time:_____ Participant ID# _____

1. What were your primary reasons for switching to MIG?

_____

_____

_____

2. Did you have goals established when making the decision to switch to MIG? If yes, what were those goals? Please tell me up to 5 goals.

1) _____

2) _____

3) _____

4) _____

5) _____

Did you meet, exceed, or not meet the goals that you had established?

3. Do you have established financial performance goals for your dairy farm?

YES NO If YES, please tell me three of your goals.

1._____

2._____

3._____

4. Describe the key management changes that occurred on your farm during the transition to Management Intensive Grazing.

_____

_____

_____

5. What were the biggest obstacles to your switch to MIG and how did you overcome them?

_____

_____

_____

_____

_____

6. Did your decision to switch to MIG include any considerations for environmental stewardship, neighbor relations, or right to farm issues?

_____

_____

_____

7. Did you outsource any management or production areas prior to switching to MIG?

_____

_____

8. What about outsourcing after switching to MIG?

_____

_____

Questions about Herd Management

1. What were your top 3 management problems associated with milk production prior to switching to MIG?

_____

_____

_____

Now, rank the three problems with 1 being the biggest problem.

2. What are your top 3 management problems associated with milk production since switching to MIG?

_____

_____

_____

Now, rank the three problems with 1 being the biggest problem.

3. Did you have any herd health concerns prior to MIG? Y N

If yes, what were the major herd health issues? List and rank the top 3 starting with the worst health issue.

_____

_____

_____

4. Do you have any herd health concerns with MIG? YES NO

If yes, what were the major herd health issues? List and rank the top 3 starting with the worst health issue.

_____

_____

5. Do you use Artificial Insemination, natural service, or a combination of the two?

6. Tell me about the hoof health of the herd. Using a scale from 1 to 5 with 1 being very poor and 5 being excellent, …

	Poor				---Excellent
What was the feet and leg condition of the herd prior to MIG?	1	2	3	4	5
What has been the feet and leg condition of the herd while on MIG?	1	2	3	4	5

How often was the hoof trimmer on the farm prior to switching to MIG? __ times per___
How often is the hoof trimmer on the farm since switching to MIG? __ times per ___

		Don't Know
How many cows left the farm per year due to feet and leg problems prior to MIG?	_____	____
How many cows leave the herd in a year due to feet and leg problems now?	_____	____

7. What herd management tools do you use?

___ Production testing – PCDART, DC305
___ Breeding wheel
___ Other

8. If on production testing, what reports do you regularly review after each test day.

_____
_____

Questions about pasture management

1. Describe your guidelines for determining when to rotate cows to a new paddock? Include details about these guidelines for seasonal changes such as differences in spring and summer management.

_____

_____

_____

2. Do you use a method to estimate pasture forage availability?

Method	**All Paddocks**	**Some Paddocks**	**Always**	**Some-times**	**Seldom**	**Never**
Pasture Stick						
Pasture Plate						
Other						
Other						

Questions about fencing.

3. What type of fencing did you invest in?

What was the total investment per foot of fence? _____

Would you invest in this type of fencing again if you were designing a new pasture system?

How has this fencing strategy worked for you? Would you do anything differently? Have you changed any of your fencing strategies since starting MIG?

_____

_____

4. What type of watering system did you invest in?

What was the total investment for the watering system? _____

Would you invest in this type of watering system again if you were designing a new watering system?

How has this watering system worked for you? Would you do anything differently? Have you changed any of your watering system since starting MIG?

_____

_____

5. How many pasture paddocks do you have that are designated only for pasture? _____

How many pasture paddocks do you have that are used for both pasture and stored forage crop production? _____

6. How do you manage cows in the heat of the summer to reduce the negative impact of heat stress?

_____

_____

Questions about Financial Management

1. What accounting system do you use?

_____

2. Who does the primary bookkeeping?

_____

3. Rate this individual on their proficiency with the accounting system. Use a scale from 1 to 5 with 1 representing a beginner and 5 being very proficient. _____

4. For which of the following purposes do you rely on your accounting records?

___ Tax Preparation
___ Business Analysis
___ Partial/Capital Budgeting
___ Loan Applications
___ Estate Planning/Business Succession
___ Other:

_____

5. Is your farm checkbook balanced from month to month? ___

6. Do you hire any of the following to assist you with financial management?

___ Bookkeeper
___ Accountant
___ Tax Preparer
___ Business Consultant
___ Financial/Investment Consultant
___ Other:

_____

7. Do you analyze the financial position of your business? ___
How often do you analyze the business? _____

8. Which of the following sections of a business analysis do you perform?

___ Balance Sheets
___ Cash Flow Statement
___ Financial Ratios Analysis
___ Multiple Year Trend Analysis
___ Cost of production reports
___ Break-even milk price calculations
___ Other: _____

9. Which financial measures do you look for in your business analysis?

_____

_____

10. Do you have concerns for the future of the dairy industry and grazing dairy farms? In other words, what are the issues you care most about for your farm and the industry right now?

_____

_____

_____

_____

_____

11. Please answer the next set of questions with yes, no, likely, or not likely. If you had to determine at this time, will you or someone be milking cows on your farm in…

5 years:	**YES**	**NO**	**Likely**	**Not Likely**
10 years:	**YES**	**NO**	**Likely**	**Not likely**
20 years:	**YES**	**NO**	**Likely**	**Not likely**

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