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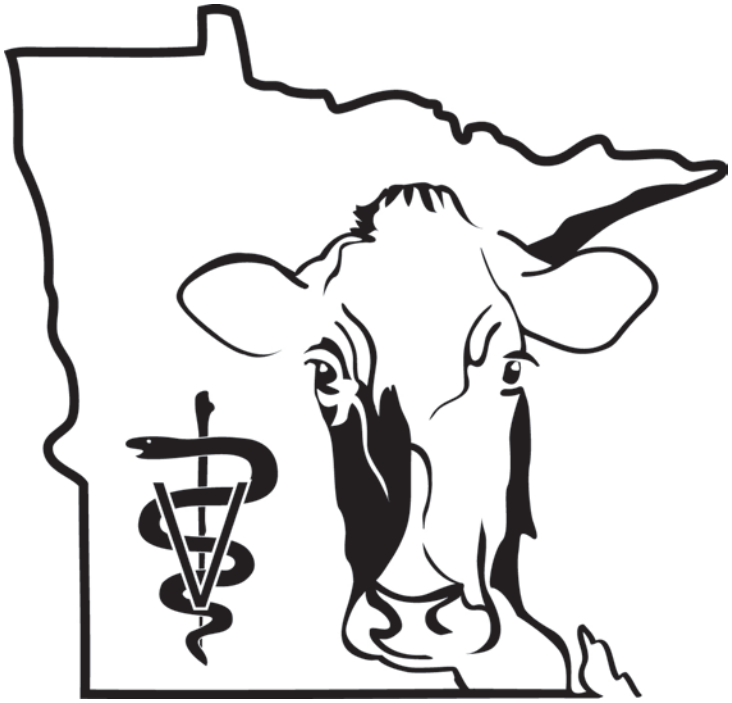

ST. PAUL, MINNESOTA
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What's the Potential for Grass-Based Dairying on Single Family Sized Dairy Farms[1]

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Introduction

Our previous work[2] used a budgeting approach comparing the economics of alternative grazing scenarios in a single family sized dairy business situation. This work suggested that pasture-based[3] dairy systems could be as profitable as confinement, year-round calving dairy systems. The results of the simulations also indicated that pasture-based, spring-calving systems, while a bit less competitive from a whole-farm, annual profit perspective, required less labor. As a result, profit per hour increased in these systems as compared to the confinement systems.

That study only took the analysis to a point where existing facilities were being used for herd sizes of 50 and 70 cows on a 150 tillable/grazable acres. Graziers have evolved beyond that point and are now making "bigger ticket" investment decisions involving milking systems and housing requirements, particularly for wintering animals. These decisions can have significant impacts on both profitability and liquidity (cash flow) of a dairy farm.

This article moves the analysis beyond our earlier work in a number of ways. The primary focus here is on the economic and financial trade-off between the labor savings and net income from increased herd size resulting from additional investments versus the annual costs of these investments in a grass-base dairy operation. The goal here is to determine the cow profit and environmental carrying capacity of a 150 acre farm using grass-based systems.

The scenarios employed in this study are initially described. These scenarios include the condition of the buildings, the initial debt loads, and current herd size and crop enterprise mix. For purposes of this study, we will assume a modified, seasonal calving system where a majority of cows calve in the spring. The investments needed to move the cow herd to 100 and 125 cows are described with their associated costs. The profitability analysis is reported first using the same measures employed in our previous work followed by a cash flow analysis that examines the years to repay additional debt under various levels of current debt and two capital replacement assumptions. Finally, a sensitivity analysis is conducted to examine the impacts on profits and cash flow by increasing production from 15 to 17 thousand pounds per year; in reality, something that might happen down the road after herd expansion and a move along the learning curve.

Description of Study Farms

This study was conducted using three base farms. These base farms are assumed to have increased their herd size from 50 cows to 70 cows in the last two years and are using management intensive grazing (MIG) methods. It is assumed they are all currently employing

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[1] This is a working draft of a paper to be submitted to the UW-Madison's Department of Agricultural and Applied Economics' Managing the Farm publication series.
[2] Frank, Gary, Rick Klemme, Bimal RajBhandary, and Larry Tranel. "Economics of Alternative Dairy Grazing Scenarios", Managing the Farm. Department of Agricultural Economics, UW-Madison, 28(3), October, 1995.
[3] In this article, we have changed the grazing label from pasture-based to grass-based to reflect its common name among graziers.

This study was conducted using three base farms. These base farms are assumed to have increased their herd size from 50 cows to 70 cows in the last two years and are using management intensive grazing (MIG) methods. It is assumed they are all currently employing year-around calving. But they want to construct a New Zealand-style swing parlor and move to modified-seasonal calving, defined here as a dairy where only 20 to 30 percent of the cows are milked through the winter months. The majority of cows will calve in the spring, but cows not making that window will not be culled. All cows will be milked in the parlor, with cows being milked in the winter using the existing stanchion barn and pipeline.[4]

The base farms differ only in the initial building compliment (details found in Appendix A). The number of crop acres, the size and production of the dairy herd, and the machinery compliment are the same on all farms.

Farm #1 has a market basis investment value in buildings of $62,000. This includes the dairy barn, milk house, milking equipment, feed and manure storage, and a machine shed. The buildings are in good repair but there has not been any major new building investment in the last 10 years.

Farm #2 has a market basis investment value in dairy buildings and equipment, feed and manure storage, and a machine shed of $112,000. The farm family has remodeled the barn, built a silo, and made some other investments in the last 10 years. The major difference from Farm #1 is the remodeled barn and a larger machine shed.

Farm #3 has a market basis investment value in dairy buildings and equipment, feed and manure storage, and a machine shed of $165,000. This farm has a heifer housing facility that is attached to the dairy barn, a grain unit, and a bigger machine shed than Farm #2. The buildings are all in excellent repair and the attached heifer housing can be converted to house a double 12 swing parlor that each farm intends to build.

Investment Required to Expand

Two expansion scenarios employing modified seasonal calving are considered. Scenario "A" is based on an expansion from 70 to 100 cows, and Scenario "B" is based on an expansion from 70 to 125 cows. In Scenario A 20 to 30 cows would be milked through the winter months, and in Scenario B 30 to 40 cows would be milked through the winter months.

The additional investment (including cows) required to expand from 70 to 100 cows (Scenario A) on Farm #1 is $144,000; on Farm #2, $129,000; and on Farm #3, $89,000 (details found in Appendix A). The difference is due to the condition of the initial set of buildings on each farm. The biggest share of this difference is due to the existence of the attached heifer housing on Farm #3. That existing structure will be used to house the new double 12 swing parlor, reducing the required investment for the parlor and building that contains the parlor by $25,000. The second largest difference is in manure storage. Farm #3 already has a large investment in manure storage, the other farms do not. The other farms are required to upgrade their manure storage to the level of Farm #3. Also, each farm must purchase $36,000 worth of livestock.

[4] We could also assume the construction of a year-round parlor to handle the winter milking. The costs of winterizing a parlor and continuing to use the existing barn and pipelines are likely similar.

The amount of additional investment required to expand from 70 to 125 cows (Scenario B) on Farm #1 is $194,000; on Farm #2, $179,000; and on Farm #3, $139,000 (details found in Appendix A). Again, the difference is due to the initial set of buildings on each farm. In this scenario, all farms were required to purchase $66,000 worth of livestock and an additional $15,000 for a bulk tank and $5,000 for cow housing.[5]

Results - Profitability

The total income of Farm #s 1, 2, and 3 equals $145,775 in the Base Scenario. This is based on a 70 cow herd with milk sales of 15,000 pounds per cow, plus cull cow, calf, and miscellaneous income of $282.50 per cow. The milk price is assumed to be $12.00.

The labor charges and the operating costs on all the farms are nearly identical. However, when calculating "return-over-costs", an opportunity interest is charge on investment and a depreciation is claimed on depreciable investments. The opportunity interest charged and the depreciation claimed on Farm #1 totaled $21,798. Those same charges were $25,427 on Farm #2 and $29,782 on Farm #3.

Prior to expansion, Farm #1 has the highest return-over-costs, Farm #2 is next, and Farm #3 has the lowest (Table 1). This occurs because given identical outputs and variable costs, the business with the lowest capital costs will have the highest return over total costs. All three farms were assigned Identical output and variable costs because there was no sound basis for discriminating among the farms. However, we recognize that over the long term, Farm #s 2 and 3 have better physical structures and lower costs for dairying into the future.

None of the base farms are making "profits" when the full cost of production is considered, although $39,369 has been deducted from total income to cover labor and management costs. However, this does not mean those farms are not building Net Worth for their owners. Substantial increases in Net Worth can occur, over the working lifetime of a farmer, on farms not making a "profit" by: 1) increases in the value of land, 2) actual interest paid being less than the opportunity interest assigned, and 3) by the willingness of a farm family to draw less for family living than the opportunity cost of their labor and management.

The total income for all farms in the 100 cow Scenario A equals $208,250. Again, this is based on milk sales of 15,000 pounds per cow, plus cull cow, calf, and miscellaneous income of $282.50 per cow. The milk price remained at $12.00 per hundredweight. In Scenario A, the labor charges on all farm are identical but the operating costs diverge somewhat because of differing required additional investment levels. In addition, you will probably note that gross margins per cow fall with the expansion. This results from the need to buy more forages from off farm sources as the farm's forage-producing capacity is exceeded. Since purchase forages exceed the variable costs of grazing or raising them on the farm, variable costs per cow increase with the expansion leading to lower gross margins.

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[5] Reviewer comments have suggested that our assumed investment levels are higher than necessary. We agree that this may be true in some situations, but we caution that we are only purchasing just enough cows for the expansion. In addition to the likelihood that more cows will be need to reach the target levels of 100 and 125 cows, young stock numbers may need to be increased too. Nevertheless, every $1000 dollars of reduced investment lowers the whole farm annual costs by xx, yy, and zz percent for cows, equipment, and buildings.

Table 1

Selected Costs, Value of Production less Total Cost Listed, and Dollars Available for Debt Service - By Farm # and Scenario

Farm #	Scenario	Insurance	Opportunity Interest	Depreciation Claimed	Labor & Management Charges	Value of Production less Total Costs Listed	Dollars Available for Debt Service
#1	Base	$ 2,000	$ 15,803	$ 5,995	$ 39,369	$ 877	$ 25,375
	A	$ 3,700	$ 24,212	$ 14,148	$ 37,455	$ (6,279)	$ 34,781
	B	$ 4,000	$ 29,059	$ 15,954	$ 43,193	$ (4,301)	$ 43,412
#2	Base	$ 2,500	$ 17,394	$ 8,033	$ 39,369	$ (2,711)	$ 25,417
	A	$ 3,700	$ 25,508	$ 15,437	$ 37,455	$ (5,523)	$ 38,121
	B	$ 4,000	$ 30,195	$ 17,183	$ 43,193	$ (2,592)	$ 47,566
#3	Base	$ 3,000	$ 19,126	$ 10,656	$ 39,369	$ (7,383)	$ 25,099
	A	$ 3,700	$ 25,806	$ 15,061	$ 37,455	$ (2,135)	$ 42,431
	B	$ 4,000	$ 30,498	$ 16,747	$ 43,193	$ 1,296	$ 51,241

The total income for all farms in Scenario B equals $260,307. This is calculated based on the same values as in the Scenarios "Base" and A, but the herd size is increased to 125. Also, in Scenario B the labor charges on all three farms are identical and the operating costs differ somewhat, again due to a differing amount of additional investment.

In Table 1 we see that, by expanding, Farm #1's profits (value of production less total costs) decline. The decrease is from $877 in the Base Scenario to a minus $6,279 in Scenario A, with a slight recovery to a minus $4,301 in Scenario B. While expansion decreases profits, this farmer could still be better off in terms of cash flow and equity accumulation by expanding under certain assumptions of existing debt and pending necessary investments. This will be discussed later in this paper.

By expanding, Farm #2's profits decrease in the 100 cow scenario and increase slightly in the 125 cow scenario. The return less total costs is a minus $2,711 in the Base Scenario, a minus $5,523 in Scenario A, and a minus $2,592 in Scenario B. This seems to say that Farm #2 should not expand using Scenario A, if Scenario B is available. A broader look at this conclusion will be provided in the discussion of Tables 2 and 3.

By expanding, Farm #3's profits increase due in large part to the condition of the existing buildings. Return less total costs is a minus $7,383 in the Base Scenario, a minus $2,135 in Scenario A, and positive $1,296 in Scenario B. This seems to say that Farm #3 should expand, and that most of the gain occurs by using Scenario A. Again, a more detailed look at this conclusion will be provided by studying Tables 2 and 3.

After expansion takes place, under either Scenario A or B, Farm #3 becomes the most profitable, Farm #2 is next, and Farm #1 is the least profitable. This reversal in ranking from

the Base Scenario is caused by the higher additional investment required on Farm #s 1 and 2. It is important to realize that production per cow must be maintained with the expansion and that, even then, the change in profit from expansion is relatively small.

Results - Cash Flow

In addition to profitability measures, the ability to cash flow the additional investment is important. In this cash flow analysis, it is assumed that all of the capital for the new investments would be borrowed and that amount added to the existing debt. In this analysis, cash flow is measure by the number of years required to repay all debts. Since existing debt level is a factor in determining the number of years required to repay all debt, three levels of existing debt $50,000, $100,000, and $150,000 are considered for all three farms.[6]

The "Dollars Available for Debt Service" column in Table 1 is a cash flow measure that represents the total dollars available to make both interest and principal payments on existing and new debt. The dollars available figure is nearly identical on each farm in the Base Scenario. However, it is interesting to note that the repayment period assuming a 10 percent interest rate (Table 2) in the Base Scenario is less than 10 years for all three farms at all three existing debt levels. This is important in that a farm should be able to repay all existing debt in ten years or less, when pending investments (capital replacement expenditures) are not taken into account, in order for it to successfully cash flow over the long run.

Table 2

Years to Repay New Investment and Existing Debt

		Existing Debt		
Farm #	Scenario	$ 50,000	$ 100,000	$ 150,000
#1	Base	2.3	5.3	9.4
	A	8.6	12.7*	19.6*
	B	8.7	11.9*	16.5*
#2	Base	2.3	5.3	9.4
	A	6.6	9.6	13.8*
	B	6.9	9.3	12.3*
#3	Base	2.3	5.3	9.5
	A	3.6	5.5	7.9
	B	4.8	6.6	8.7

* Unlikely to cash flow because of needed investments in the out years.

The dollars available figure on Farm #1 increases by $9,406 and $18,037 in Scenarios A and B, respectively. The required additional investment is $144,000 for Scenario A and $194,000 for Scenario B. In this case, the last $50,000 of investment (going from Scenario A to B, which

[6] We could have just used net cash flow as the cash flow measure, but we viewed a payback period as a way of measuring the relative strength of the cash flow between scenarios.

represents an investment mostly in cows) generates nearly as much additional debt service dollars as the first $144,000 of investment. Table 2 shows that the repayment period is not substantially different between Scenarios A and B. Therefore it appears that Farm #1 should not choose Scenario A, if Scenario B is available, since Scenario B increases profits and has an equal repayment period. Discussion about Table 3 will support this finding. However, it should be noted that expansion with $100,000 or more in existing debt leads to repayment periods beyond 10 years, a problem if new/replacement investments must be purchased/financed when debt is still owed on the buildings and equipment purchased in the expansion.

Debt service dollars available on Farm #2 increase by $12,704 and $22,149 in Scenario A and B, respectively. The required additional investment is $129,000 for Scenario A and $179,000 for Scenario B. The last $50,000 of investment (Scenario A to B) generates about $9,000 of additional debt service dollars versus almost $13,000 for the first $129,000 of investment. Table 2 shows that the years to repay does not change substantially as Farm #2 expands from Scenario A or B. Therefore, the earlier conclusion that Farm #2 should not choose Scenario A, if Scenario B is available, has additional support. However, expanding (and the associated borrowing) with an existing debt of $150,000 leads to a repayment period of over 10 years.

Debt service dollars available on Farm #3 increase by $17,332 and $26,142 in Scenario A and B, respectively. The required additional investment is $89,000 for Scenario A and $139,000 for Scenario B. The last $50,000 of investment generates about $9,000 of additional debt service dollars versus about $17,000 for the first $89,000 of investment. Table 2 shows that the years to repay increases when Farm #3 expands using Scenario B versus Scenario A. Therefore, Farm #3 may be better off expanding using Scenario A, although profits do slightly increase with Scenario B.

Notice when both Farm #1 and Farm #3 have debts before expansion of $50,000, Farm #1 needs 8.7 years to repay that amount plus the new investment. However, Farm #3 can accomplish the same task in only 4.8 years. If Farm #1 has an existing debt of $75,000 or more, that business needs to become more efficient before expansion if it is to have a reasonable chance of cash flowing (paying debt off in less than 10 years). The same is true for Farm #2 if existing debts are $105,000 or more. Farm #3 could likely cash flow an expansion with additional debt up to $160,000.

Results - Cash Flow with Pending Investments

The results shown on Table 3 are calculated using various levels of pending investment, defined as capital replacement needed to maintain the base farm. The amount of pending investment is varied depending on whether the farm would invest in a major expansion now, using either Scenario A or B, or continue with the base scenario.

Our analysis (Table 3) assumes all three farms have $120,000 of pending investment over the next 10 years if they do not expand. If they expand using Scenario A, $60,000 of pending investment would remain. If they expand using Scenario B, $40,000 of pending investment would remain.

Table 3 shows that if any of the three farms have existing debt of $150,000 and pending investments before expansion over the next 10 years of $120,000, their only hope for the long

term is some combination of efficiency and expansion. If they do not expand and are required to replace $120,000 of capital over the next 10 years, their indebtedness will likely increase. Farms in this type of situation are in a similar situation to driving a car and approaching an intersection as the light turns yellow. You have two choices. One is to stop, quit farming. The other is to put the "petal to the medal" and hope you make it through the intersection without crashing.

Table 3

Years to Repay New Investment and Existing Debt With Pending Investment Considered

		Existing Debt		
Farm #	Scenario	$ 50,000	$ 100,000	$ 150,000
#1	Base*	4.9	14.5	>25
	A**	11.8	19.8	>25
	B***	10.1	14.4	21.6
#2	Base*	4.9	14.4	>25
	A**	8.6	13.1	21.3
	B***	7.8	10.7	14.8
#3	Base*	5	15.1	>25
	A**	4.3	6.8	10.1
	B***	5.4	7.4	10

* Assumes pending investments of $120,000 over the next 10 years.

** Assumes additional investments over the next 10 years of $60,000.

*** Assumes additional investments over the next 10 years of $40,000.

Table 3 shows that Farm #3 requires less years to repay debt than either Farm #2 or #1 in all expansion scenarios, but about equal time to repay if no expansion takes place. This means that Farm #3 has a better chance of a successful expansion than Farm #1 or 2, particularly at high debt levels.

However, owners of a type #1 farm still have two chances. One, they can stay where they are, which is at a point where all costs including $39,369 of labor and management are being covered (Table 1) and they are able to repay existing debt in less than 5 years, even with pending investments. The second chance will rely on a "Sweat Equity" approach. Using your own labor and sweat, you may be able to expand a Type #1 farm for less than the $194,000 assumed in this study. If you can expand it to 100 cows for $89,000 or to 125 cows for $139,000, you have essentially reduced the additional investment and converted a type #1 farm into a type #3 farm.

One final word about the results shown on Table 3. It shows that if you are planning on spending almost $200,000 (like Farm #1) to expand from 70 to 125 cows, your existing debt needs to be less than $50,000 in order for the expansion to cash flow.

Net Worth change is not addressed in this study because the increase in Net Worth depends heavily on the amount of hired labor and family living dollars required. Farm businesses that spend less for those two items than the "Labor and Management Charges" will have those additional dollars available to increase the business's Net Worth. They will also have additional dollars available for debt service. Farm businesses that have hired labor and family living expenditures that exceed the "Labor and Management Charges" will have a lower increase (larger decrease) in Net Worth at the end of any given time period and will have a more difficult time keeping current with their loan payments. In addition, net worth in terms of the market value of the farm may be enhanced by an expansion that results in the farm having a better chance of being seen as a viable farm unit.

In our example, we were curious about the influence on higher production on both profitability and cash flow measures. This is, of course, the easy way to a better financial situation on paper and should be carefully interpreted because higher herd averages come with anticipated costs (that we have hopefully included) and some costs - herd health perhaps - that may not be expected. Furthermore, there is always the issue of putting more milk on the market and the potential impact of a large number of dairy farmers both expanding herds and production per cow. However, if you are interested, we have included Tables 1-3 in Appendix B where milk production has been assumed to increase to 17,000 pounds sold annually per cow. One could interpret Tables 1-3 in the main body of this article as the expected outcomes during and soon after the expansion phase with Tables 1-3 in the Appendix B representing expected outcomes a few years down the road.

From a profit standpoint at the 17,000 pound production level, the value of production less total costs is positive in all base and expansion scenarios. Expansion is more profitable in the sense that increased gross income from higher milk sales per cow does cover the anticipated additional costs of feed, etc. and the annual costs associated with owning the additional buildings and equipment in every case but Farm #1 expanded to 100 cows. This, of course, generates more dollars available for debt service in Table 1 which leads to reduced repayment periods in both Tables 2 and 3.

A cautionary note needs to be made with respect to production per cow. We have observed situations where production per cow in modified seasonal systems has been less than 15,000 pounds. Of course, some costs may be lower in those situations than those assumed in this study and net income may possibly be higher. But, the point is that each operator needs to do budget carefully when contemplating an expansion.

Conclusions

Some basic conclusions[7] from the analysis are listed below:

- Expansion for the three farm types as we have described them is basically a break-even proposition from a profitability standpoint, although Farm #3 does fare a bit better. This may say something about the optimal size of herd for the investment we've included. On the other hand, it may require a re-thinking about the investment needed and/or either sweat equity considerations.

[7] Maybe these should be stated as working hypotheses waiting to be confirmed or disproved by the grazing community.

- It appears that, in fact, the best thing to do from a short-term net income perspective might be to get the 70 cows to 17,000 pounds of annual production; particularly on Farms 1 and 2. Profits are higher in this case, although milking cows in a stall environment may not be desirable. However, flat barn parlors might be a short-term alternative with equity being built for a labor-saving parlor in the future. In addition, there may be less expensive manure storage/management options available than what we have specified.

- All repayment periods increase with the expansion and in many cases they extend beyond 10 years, particularly when pending investments are included, a warning sign to the long-term financial sustainability of any farm.

- We have not addressed manure management and nutrient loading in this paper. We are fairly certain that 125 cows (Holsteins) plus replacements and suspect that 100 cows plus replacements on 150 acres will result in soil nutrient increases for nitrogen, phosphorus, and potassium. The extent of the nutrient surplus and possible related environmental problems will depend on a number of factors not limited to soil type, slope, and distance to both ground and surface water; existing soil test levels; and extent of ground cover, condition of pasture sod and soil erosion. (note - we do intend to conduct a whole-farm nutrient balance and include the results in the final version of this paper)

- The results are not intended to diminish anyone's enthusiasm for expansion. With a parlor included, expansion does give the farmer significantly more flexibility in herd size, will likely increase the market value and may likely increase the net worth of the farm for sale in the future, and allows a better lifestyle simply from less wear and tear on the human milking machine.

- Most importantly, we do recommend that you use this paper as one piece of information in your decision-making process. Experiences of other graziers who have moved to this type of operation and seeing actual on-farm financial numbers are certainly very important pieces of information to acquire as you consider this decision. We welcome any feedback that you have from reading this paper and look forward to including it in our on-going work in this area.

Appendix A

Farm #1's Information

Buildings on Base Farm #1:

Item:	Value:	Note:
Milk House & Equipment	$10,000	
Milking Equipment	$10,000	Pipeline
Cow Housing	$20,000	50 cow stanchion barn (run down)
Heifer Housing	$2,000	Old machine shed
Manure Storage	$0	
Feed Storage	$5,000	One silo
Feeding Equipment	$5,000	Silo unloader + misc.
Machine Shed (12 ft walls)	$10,000	40 feet by 80 feet
Total	$62,000	

Additional Investment Required on Base Farm #1 in Order to Proceed from 70 to a 100 Cows:

Item:	Value:	Note:
Milk Parlor & Building	$50,000	Swing double 12 parlor
Bulk Tank	$5,000	Used
Cow Housing	$13,000	Bedded pack in machine shed
Heifer Housing	$0	Outwintering or rent building
Manure Storage	$20,000	1-2 month's storage
Feed Storage	$10,000	Horizontal storage
Feeding Equipment	$10,000	Drive by feeding - skid steer
36 Cows	$36,000	30 -1st year + 6 -2nd year
Total	$144,000	

Additional Investment Required on Base Farm #1 in Order to Proceed from 70 to a 125 Cows:

Item:	Value:	Note:
Milk Parlor & Building	$50,000	Swing double 12 parlor
Bulk Tank	$20,000	New
Cow Housing	$18,000	Bedded pack in machine shed
Heifer Housing	$0	Outwintering or rent building
Manure Storage	$20,000	1-2 month's storage
Feed Storage	$10,000	Horizontal storage
Feeding Equipment	$10,000	Drive by feeding - skid steer
66 Cows	$66,000	55 -1st year + 11 -2nd year
Total	$194,000	

Farm #2's Information

Buildings on Base Farm #2:

Item:	Value:	Note:
Milk House & Equipment	$10,000	
Milking Equipment	$10,000	Pipeline
Cow Housing	$40,000	50 cow stanchion barn (remodeled)
Heifer Housing	$2,000	Old machine shed
Manure Storage	$10,000	Cement pad and 1 month's storage
Feed Storage	$10,000	Two silos
Feeding Equipment	$10,000	Two silo unloaders + misc.
Machine Shed (14 ft walls)	$20,000	48 feet by 90 feet
Total	$112,000	

Additional Investment Required on Base Farm #2 in Order to Proceed from 70 to a 100 Cows:

Item:	Value:	Note:
Milk Parlor & Building	$50,000	Swing double 12 parlor
Bulk Tank	$5,000	Used
Cow Housing	$13,000	Bedded pack in machine shed
Heifer Housing	$0	Outwintering or rent building
Manure Storage	$10,000	Update to 1-2 month's storage

Feed Storage	$5,000	Horizontal storage
Feeding Equipment	$10,000	Drive by feeding - skid steer
36 Cows	$36,000	30 -1st year + 6 -2nd year
Total	$129,000	

Additional Investment Required on Base Farm #2 in Order to Proceed from 70 to a 125 Cows:

Item:	Value:	Note:
Milk Parlor & Building	$50,000	Swing double 12 parlor
Bulk Tank	$20,000	New
Cow Housing	$18,000	Bedded pack in machine shed
Heifer Housing	$0	Outwintering or rent building
Manure Storage	$10,000	Update to 1-2 month's storage
Feed Storage	$5,000	Horizontal storage
Feeding Equipment	$10,000	Drive by feeding - skid steer
66 Cows	$66,000	55 -1st year + 11 -2nd year
Total	$179,000	

Farm #3's Information

Buildings on Base Farm #3:

Item:	Value:	Note:
Milk House & Equipment	$10,000	
Milking Equipment	$10,000	Pipeline
Cow Housing	$40,000	50 cow stanchion barn (remodeled)
Heifer Housing	$15,000	Attachment to dairy barn
Manure Storage	$20,000	Cement pad and 3 month's storage
Feed Storage	$25,000	Two silos + one grain unit
Feeding Equipment	$15,000	Three silo unloaders + misc.
Shop/Machine Shed	$30,000	60 feet by 90 feet
Total	$165,000	

Additional Investment Required on Base Farm #3 in Order to Proceed from 70 to a 100 Cows:

Item:	Value:	Note:
Milk Parlor	$25,000	Swing double 12 parlor - inside existing youngstock housing
Bulk Tank	$5,000	Used
Cow Housing	$13,000	Bedded pack in machine shed
Heifer Housing	$0	Outwintering or rent building
Manure Storage	$0	
Feed Storage	$0	
Feeding Equipment	$10,000	Drive by feeding - skid steer
36 Cows	$36,000	30 -1st year + 6 -2nd year
Total	$89,000	

Additional Investment Required on Base Farm #3 in Order to Proceed from 70 to a 125 Cows:

Item:	Value:	Note:
Milk Parlor	$25,000	Swing double 12 parlor - inside existing youngstock housing
Bulk Tank	$20,000	New
Cow Housing	$18,000	Bedded pack in machine shed
Heifer Housing	$0	Outwintering or rent building
Manure Storage	$0	
Feed Storage	$0	
Feeding Equipment	$10,000	Drive by feeding - skid steer
66 Cows	$66,000	55 -1st year + 11 -2nd year
Total	$139,000	

WISCONSIN DAIRY GRAZING ANALYSIS 1995

by
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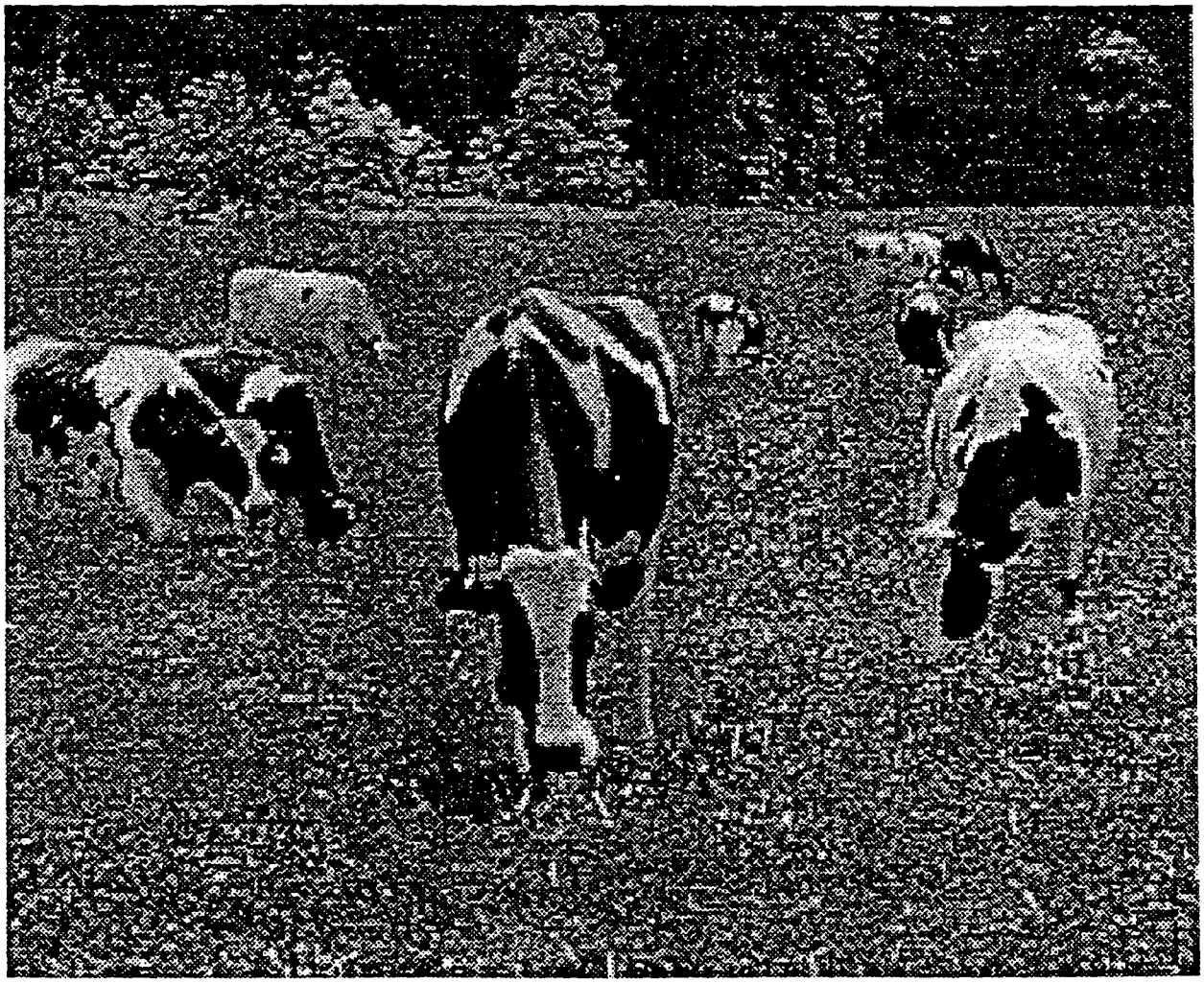

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WISCONSIN DAIRY GRAZING ANALYSIS
1995*

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WISCONSIN DAIRY GRAZING ANALYSIS
1995 ANNUAL REPORT

Summary

This report summarizes the individual farm records of 27 grazing dairy farms in Wisconsin for 1995. This report is for the first year of a two-year study. Readers are cautioned about drawing conclusions from these data.

Whole farm information is reported. The year end analysis was performed primarily by agriculture agents using FINPACK 8.0 from the Center for Farm Financial Management at the University of Minnesota. The individual analyses were summarized at the Center for Farm Financial Management using FINANSUM.

The tables are divided into two groups. Tables 1 through 6 present information for all 27 farms. Averages for all farms, averages of the low 25% and averages of the high 25% as sorted by net farm income are presented for each of these 6 tables.

Tables 7 through 11 present information for the 27 farms organized into two categories - Lower Capital and Higher Capital. Lower Capital graziers have been grazing for a few years and have scaled down on a number of traditional dairy assets for harvesting feed, etc. or they started out as graziers. Higher Capital graziers have been grazing for a short period of time and still own many assets considered typical for a traditional dairy. They are in transition to a Lower Capital grazing situation or have chosen to graze and also maintain a complement of traditional dairy assets.

Limitations of the Analysis

Data and methodology for the study created limitations for completing the analysis. The primary goal of analyzing dairy farms practicing rotational grazing was to determine how profitable they were and to better understand why they were at their level of profitability. As such, the obvious starting point is a measure of profitability.

The common measures of profitability recommended by the Farm Financial Standards Task Force (FFSTF) are net farm income (NFI), return on equity (ROE), and return on assets (ROA). An advantage to using NFI is that it is an absolute dollar amount indicating whether the farm provided sufficient income for family withdrawals. Its disadvantage is that it does not account for farm size; generally larger, multi-family farms will have larger NFIs. An advantage to using rates of returns is that they allow for comparing larger and smaller farms on a common basis; however, because they are ratio measures, they do not indicate whether profits were sufficient to meet family withdrawals.

Our methodology employed FINANSUM, which measures profitability on the basis of NFI. Applying this measure, the top 25% of farms sorted by NFI averaged over $75,000. This is significantly higher than the average of all farms in the study, and is a very desirable

level of income contrasted to reasonable family withdrawals among Wisconsin families. However, it is uncertain whether these are multi-family farms, which would require NFI to be divided by the number of families involved. Data were not available for determining the number of families involved in each farm, nor does FINANSUM allow profitability to be measured on the basis of ROA. Consequently, the analysis should be related to the farm and not the farm family.

It follows, after sorting farms based on their profitability, to wonder why differences in profitability occurred. Insight is gained by knowing various information such as the number of cows, milk production, and the number of operators. Unfortunately these data were not available for the first year's information. These data will be collected for the final report.

Finally, the study classifies graziers as "Lower Capital" or "Higher Capital" based on the length of time grazing and the amount of traditional dairy assets. The analysis is completed based on this classification. Perhaps a more interesting question is whether graziers with less traditional dairy assets were more profitable? Unfortunately, the FINANSUM program doesn't allow the data to be sorted so that this question might be answered.

In summary, there are limitations to completing various analyses; however, the analysis that was completed presents useful information for graziers to compare with their own farms' performance.

Highlights of the Analysis

Highlights of the analysis are presented for Tables 1-6 and 7-11, rather than having drawn conclusions from these data. Caution is encouraged in reaching conclusions because the data represent only one year's performance, and have potential outliers, on a relatively small number of farms

TABLES 1- 6

Some highlights of tables 1 through 6 are as follows. Gross Cash Farm Income(Table 1) ranged from $198,403 for the 25% of the farms with the highest Net Farm Income to $94,918 for the 25% of the farms with the lowest Net farm Income. Net Cash Farm Income(Table 2) was $54,568 for the 25% of the farms with the highest Net farm Income and $15,272 for the 25% of the farms with the lowest Net Farm Income. The average Net Cash Farm Income was $34,328. The average Rate of Return on Assets(Table 3) was 9.2%, ranging from 2.8% for the 25% of the farms with the lowest Net Farm Income to 15.6% for the 25% of the farms with the highest Net Farm Income. The Current Ratio(Table 6) averaged 2.28 at the end of 1995. The Farm Debt to Asset Ratio(Table 6) averaged 44% at the end of 1995 and the Asset Turnover Ratio(Table 6) averaged 31.9%.

TABLES 7 - 11

Some highlights of Tables 7 through 11 are as follows. These tables compare "Lower Capital" graziers to "Higher Capital" graziers. Definitions of these two types is given on page 2. Gross Cash Farm Income(Table 7) was $100,592 for the Lower Capital group

and $154,453 for the Higher Capital group. Purchased feed expense (Table 8) for the Lower Capital group was $22,273 and $31,034 for the Higher Capital group. Net Cash Farm Income(Table 8) was $31,871 for the Lower Capital group and $36,017 for the Higher Capital group. Net Farm Income was $37,446 for the Lower Capital group and $38,330 for the Higher Capital group.

The Lower Capital group is more liquid with a higher end of 1995 Current ratio (Table 11) of 6.46 compared to 1.53 for Higher Capital. The Lower Capital group is also more solvent with an end of 1995 debt to asset ratio(Table 11) of 31% compared to 49% for Higher Capital farms. The Rate of Return on Farm Assets for the Lower Capital group was 11.1% compared to 8.5% for the Higher Capital group. Finally, the Asset Turnover Rate was 35.4% for the Lower Capital group and 30.5% for the Higher Capital group. On average, while NFI is similar between the Higher and Lower Capital groups, the Lower Capital group has a higher ROA.

EXPLANATORY NOTES FOR TABLES

The analysis was performed using FINPACK 8.0 from the Center for Farm Financial Management at the University of Minnesota. The individual analyses were summarized at the Center for Farm Financial Management using FINANSUM.

Tables 1 through 3 and 5 through 11 include the same number of farms, which were all of the farms whose records were judged to be of sufficient quality to be included in the overall report.

Table 4, the Balance Sheet, includes only sole proprietors. Partnerships and corporations are excluded because some debt is held outside of the business causing potential misinterpretations of the financial statement.

The tables are divided into two groups. Tables 1 through 6 include averages for all farms, averages of the low 25% and high 25% as sorted by net farm income. Tables 7 through 11 present information for all farms organized into two groups — Lower Capital and Higher Capital. More information on these two groups can be found on page 2.

Rounding of individual items for the report may have caused minor discrepancies with the printed totals which are calculated before rounding.

Tables 1 and 2. Detailed Farm Profit or Loss Statement

This statement is a summary of income, expenses, and resultant profit or loss from farming operations during the calendar year. The purpose of Table 1 and 2 is to measure profit, from a cash and accrual perspective. Profit answers this question: How did the production process perform? Profit tells you whether the revenue earned from production exceeded the expenses associated with the resources required to produce.

Table 1 lists cash farm income from all sources.

Table 2 lists cash expenses. "Labor" includes only labor hired. "Interest" includes only interest actually paid. No opportunity charges on farm equity capital or unpaid labor are included.

The difference between "Gross Cash Farm Income" and "Total Cash Expense" is the "Net Cash Farm Income." This is net farm income on a cash basis.

Table 2 also measures non-cash changes in the farm business. The "Inventory Changes" and "Depreciation and Other Capital Adjustments" sections are used to convert the cash income statement (Net Cash Farm Income) into an accrual income statement. The "bottom line," labeled "Net Farm Income," represents the return to the operator's and family's unpaid labor, management, and equity capital (net worth). In other words, it represents the

return to all of the resources which are owned by the farm family and, hence, not purchased or paid a wage. However, it does not include any debt forgiveness or asset repossessions.

Table 3. Profitability and Liquidity Analysis

Various measures of performance are calculated for the farms in this report. These include measures of profitability and liquidity. (Solvency measures are in Table 6.) In Tables 1 and 2 no opportunity costs are used. In Table 3, opportunity costs for labor, capital, and management are used. The measures and their components are described below.

Profitability

"Labor and management earnings" equals "Net Farm Income" from Table 2 minus an opportunity interest cost of 6% on average farm net worth.

"Rate of return on investment" is the "Return to farm investment" divided by "Average farm investment."

"Rate of return on net worth" is the "Return to farm net worth" divided by "Average farm net worth."

"Net profit margin" is the "Return to farm investment" divided by "Value of farm production."

"Asset turnover rate" is the "Value of farm production" divided by "Average farm investment."

"Interest on farm net worth" is the "Average farm net worth" multiplied by a 6% opportunity interest cost charge.

"Farm interest" is the accrued interest cost so it will be different from Table 1.

"Value of operator's labor and management" is its opportunity cost.

"Return to farm investment" is calculated by adding "Farm interest paid" and "Net Farm Income" and then subtracting the "Value of operator's labor and management."

"Average farm investment" is the average of beginning and ending total farm assets.

"Return to farm net worth" is calculated by subtracting the "Value of operator's labor and management" from "Net Farm Income."

"Average farm net worth" is the average of beginning and ending farm net worth.

"Value of farm production" is gross farm income minus feeder livestock purchased and adjusted for inventory changes in crops, market livestock and breeding livestock.

Liquidity: Cash Basis

"Family Living and Taxes Paid" is the total family use of cash.

"Cash available for intermediate debt service" on the cash basis is "Total net income" minus "Family living and taxes paid" and "Real estate principal payments."

"Average intermediate debt" is the average of beginning and ending intermediate farm liabilities.

"Years to turn over intermediate debt" is "Average intermediate debt" divided by "Cash available for intermediate debt service." If either the cash-based or accrual-based "Cash available for intermediate debt" is a negative number, debt repayment is not possible because of negative cash flow and "Years to turn over intermediate debt" cannot be calculated.

"Cash expense as a percent of income" is "Total cash expense" divided by "Gross cash farm income."

"Interest as a percent of income" is "Interest paid" divided by "Gross cash farm income."

Liquidity: Accrual Basis

"Cash available for intermediate debt service" on the accrual basis is "Total net income" minus "Family living and taxes paid" and "Real estate principal payments" adjusted for inventory changes listed in Table 2.

"Accrual expense as a percent of income" is "Total cash expense" divided by the sum of "Gross cash farm income" and "Inventory change."

"Interest as a percent of income" is the sum of "Interest paid" and accrued interest which is then divided by "Gross cash farm income."

Table 4. Comparative Balance Sheet

The beginning and ending net worth statements and solvency measures are presented for sole proprietors only in Table 4. Current assets are valued at market price at the time of the inventory which is January 1, and December 31, for the beginning and ending inventories, respectively. Intermediate and long-term assets that are depreciable are valued at conservative market price. Raised breeding livestock is valued at conservative market replacement costs. Land is valued at conservative market price.

Table 5. Statement of Cash Flows

The Statement of Cash Flows measures the amount of cash that flowed into and out of the business during the accounting period. Cash flows are organized into three categories: Cash From Operating Activities, Cash From Investing Activities and Cash From Financing Activities. Cash From Operating Activities includes cash inflow and outflow from all normal ongoing activities associated with production, family living and income and social security tax. Cash From Investing Acitivies includes all purchases and sales of capital assets. Cash From Financing Activities includes borrowing, principal payments and gifts.

The "Net Change in Cash Balance" is the net amount of cash inflow during the year.

Table 6. Financial Guidelines Measures

This table contains the Farm Financial Standards Task Force's financial measures for evaluating a farm's financial position and performance. These measures are explained below following the descriptions found in the FINPACK manual.

Liquidity

The "current ratio" is calculated by dividing the total current farm assets by the total current farm liabilities.

"Working capital" is calculated by subtracting current farm liabilities from current farm assets.

Solvency (Market)

The "farm debt to asset ratio" is calculated by dividing the total farm liabilities by the total farm assets. It is similar to the total percent in debt ratio listed earlier. The difference is that nonfarm assets and liabilities are included in the total percent in debt but not in the farm debt to asset ratio.

The "farm equity to asset ratio" is calculated by dividing farm equity or net worth by the total farm assets. It measures the proportion of the farm assets financed by the owner's equity as opposed to debt. This is the opposite of the debt to asset ratio. These two measures always add up to 100% because they describe how total farm assets are financed.

The "farm debt to equity ratio" measures farm debt relative to farm equity. It is calculated by dividing the total farm liabilities by the total farm net worth. The debt to equity ratio measures the amount of borrowed capital being employed for every dollar of equity capital.

Profitability

The "rate of return on farm assets" can be thought of as the average interest rate being earned on all investments in the farm or ranch business. If assets are valued at market value, the rate of return on assets can be looked at as the "opportunity cost" of farming versus alternate investments. If assets are valued at cost value, the rate of return on assets more closely represents the actual return on the average dollar invested in the farm. The rate of return on farm assets is calculated as follows: Rate of Return on Assets = Return on Farm Assets ÷ Average Farm Investment, where: Return on Farm Assets = Net Farm Income + Farm Interest - Value of Operator's Labor & Management, and Average Farm Investment = (Beginning Total Farm Assets + Ending Total Farm Assets) ÷ 2.

The rate of return on farm equity" represents the interest rate being earned on your farm net worth. If assets are valued at market value, this return can be compared to returns available if the assets were liquidated and invested in alternate investments. If assets are valued at cost value, this more closely represents the actual return on the funds that have been invested or retained in the business. The rate of return on farm equity is calculated as follows: Rate of Return on Equity = Return on Farm Equity ÷ Average Farm Net Worth, where: Return on Farm Equity = Net Farm Income - Value of Operator's Labor & Management, and Average Farm Net Worth = (Beginning Farm Net Worth + Ending Farm Net Worth) ÷ 2.

"Operating profit margin" is a measure of the operating efficiency of the business. It is calculated as follows: Operating Profit Margin = Return to Farm Assets ÷ Value of Farm Production. If expenses are held in line relative to the value of output produced, the farm will have a healthy net profit margin. A low net profit margin may be caused by low prices, high operating expenses, or inefficient production.

"Net farm income" represents the returns to unpaid labor, management, and equity capital invested in the business.

Efficiency

"Asset turnover rate" is a measure of efficiency in using capital. It is calculated as follows: Asset Turnover Rate = Value of Farm Production ÷ Total Farm Assets.

The last four ratios reflect the distribution of gross income to cover operating expenses and generate farm income. The sum of the operating expense ratio, the depreciation expense ratio, and the interest expense ratio equals the percent of gross income used to pay business expenses. The amount remaining is net farm income. The gross farm income used to calculate these ratios is the accrual gross farm income.

The "operating expense ratio" is calculated as (Total Farm Operating Expense - Farm Interest Expense) ÷ Gross Farm Income. This ratio indicates the percent of the gross farm income that was used to pay operating expenses. Total farm operating expense is the accrual total operating expense.

The depreciation expense ratio" is calculated as Depreciation ÷ Gross Farm Income. This ratio indicates the percent of the gross farm income that was used to cover depreciation and other capital adjustments.

The "interest expense ratio" is calculated as Farm Interest Expense ÷ Gross Farm Income. This ratio indicates the percent of the gross farm income used for farm interest expenses. This is the same ratio as the accrual "interest as a percent of income" measure from the Liquidity section in Table 3.

The "net farm income ratio" is calculated as Net Farm Income ÷ Gross Farm Income. This ratio indicates the percent of the gross farm income that remained after all expenses.

Tables 7-11

These tables are identical to Tables 1-6 except that the sample farms were divided into two groups: Lower Capital Graziers and Higher Capital Graziers and the balance sheet table (Table 4) was omitted. Definitions for these two groups can be found on page 2.

Table 1
FARM INCOME STATEMENT, 1995
Wisconsin Dairy Grazing Analysis
University of Wisconsin Extension
(Farms sorted by Net Farm Income)

	Average Of All Farms	Average Of Low 25%	Average Of High 25%
Number of Farms	27	7	7
CASH FARM INCOME			
Corn	576	-	-
Alfalfa Hay	100	-	-
Mixed Hay	148	571	-
Oats	36	-	-
Background Beef	75	-	290
Grazing Beef	1338	243	4917
Eggs	11	42	-
Milk	115679	85438	174985
Dairy Calves	1434	1003	2594
Dairy Heifers (for sale)	287	40	-
Dairy Replacement Heifers	56	-	217
Dairy Steers	632	-	-
Finish Cull Cows	115	442	-
Cull breeding livestock	5135	2829	8086
Misc. livestock income	1072	494	300
Deficiency payments	636	327	2086
CRP payments	40	105	-
Other government payments	2117	1377	1477
Custom work income	228	176	24
Patronage dividends, cash	722	84	375
Insurance income	63	-	-
Other farm income	2011	1747	3050
Gross Cash Farm Income	132510	94918	198403

Table 2
FARM INCOME STATEMENT, 1995 (Continued)
Wisconsin Dairy Grazing Analysis
University of Wisconsin Extension
(Farms sorted by Net Farm Income)

	Average Of All Farms	Average Of Low 25%	Average Of High 25%
Number of Farms	27	7	7
CASH FARM EXPENSE			
Seed	1794	871	2510
Fertilizer	2121	949	2530
Crop chemicals	783	237	571
Crop insurance	13	14	36
Crop miscellaneous	281	29	377
Purchased feed	27465	20810	44918
Breeding fees	1117	974	1323
Veterinary	3822	3085	5350
Livestock supplies	5345	3575	7172
Livestock leases	158	289	-
Livestock marketing	3262	2479	3956
Interest	12463	12060	14753
Fuel & oil	2378	1249	3335
Repairs	7226	5426	11627
Custom hire	2036	1342	3977
Hired labor	8608	6327	15224
Land rent	3064	1451	3907
Machinery & bldg leases	462	974	138
Real estate taxes	3644	4820	4448
Farm insurance	1730	1487	2256
Utilities	3838	2922	5087
Dues & professional fees	406	778	572
Hedging account deposits	271	-	-
Miscellaneous	5895	7500	9769
Total cash expense	98182	79646	143835
Net cash farm income	34328	15272	54568
INVENTORY CHANGES			
Crops and feed	717	1807	-3624
Market livestock	-757	347	-1303
Accounts receivable	-68	-1922	475
Prepaid expenses and supplies	-210	-231	257
Accounts payable	1948	3059	3002
Total inventory change	1630	3059	-1194
Net operating profit	35958	18331	53375
DEPRECIATION AND OTHER CAPITAL ADJUSTMENTS			
Breeding livestock	8155	9554	16879
Machinery and equipment	-4399	-5081	-7426
Buildings and improvements	-1672	-13697	11194
Other farm capital	-72	-1199	1125
Total depr. and other capital adj	2012	-10422	21772
Net farm income	37970	7909	75147

Table 3
PROFITABILITY AND LIQUIDITY ANALYSIS, 1995
Wisconsin Dairy Grazing Analysis
University of Wisconsin Extension
(Farms sorted by Net Farm Income)

	Average Of All Farms	Average Of Low 25%	Average Of High 25%
Number of Farms	27	7	7
PROFITABILITY (Market)			
Net farm income	36184	7923	68245
Labor and management earnings	24326	-1884	49902
Rate of return on assets	9.2%	2.8%	15.6%
Rate of return on equity	10.1%	-2.1%	19.9%
Operating profit margin	29.0%	10.6%	46.1%
Asset turnover rate	31.9%	26.5%	33.9%
Interest on farm net worth	11858	9807	18343
Farm interest expense	12812	12407	15768
Value of operator lbr and mgmt.	16217	11397	7500
Return on farm assets	32779	8933	76513
Average farm assets	354556	316026	489945
Return on farm equity	19967	-3474	60745
Average farm equity	197633	163456	305724
Value of farm production	113092	83894	165913
Number of Farms	27	7	7
LIQUIDITY (Cash)			
Net cash farm income	34328	15272	54568
Net nonfarm income	3517	2600	-
Family living and taxes	25861	8372	43594
Real estate principal payments	1245	-	3986
Cash available for interm. debt	10740	9500	6988
Average intermediate debt	50803	28266	55134
Years to turnover interm. debt	4.7	3.0	7.9
Expense as a % of income	74%	84%	72%
Interest as a % of income	9%	13%	7%
LIQUIDITY (Accrual)			
Total accrual farm income	132402	95150	193951
Total accrual farm expense	96444	76819	140577
Net accrual operating income	35958	18331	53375
Net nonfarm income	3517	2600	-
Family living and taxes	25861	8372	43594
Real estate principal payments	1245	-	3986
Available for intermediate debt	12370	12559	5794
Average intermediate debt	50803	28266	55134
Years to turnover interm. debt	4.1	2.3	9.5
Expense as a % of income	73%	81%	72%
Interest as a % of income	10%	13%	8%

Table 4
BALANCE SHEET AT MARKET VALUES, 1995
Wisconsin Dairy Grazing Analysis
(Farms sorted by Net Farm Income)

	Average Of All Farms		Average Of Low 25 %		Average Of High 25 %	
Number of Farms	26		7		6	
	Beginning	Ending	Beginning	Ending	Beginning	Ending
ASSETS						
Current Farm Assets						
Cash and checking balance	4328	6931	5247	2975	3751	11644
Prepaid expenses & supplies	809	591	431	200	-	299
Growing crops	-627	-	2328	-	-	-
Accounts receivable	345	574	262	243	-	117
Hedging account	-	-	-	-	-	-
Crops held for sale or feed	15374	17146	9162	10969	18392	18614
Crops under government loan	-	-	-	-	-	-
Market livestock held for sale	1244	781	1011	1357	120	-
Other current assets	4427	4767	2286	2711	2352	2850
Total current farm assets	27154	30790	20727	18455	24615	33524
Intermediate Farm Assets						
Breeding livestock	76624	84629	73114	84164	87813	100382
Machinery and equipment	45987	46836	50522	49915	66710	62603
Other intermediate assets	18507	18021	4060	3147	23942	23252
Total intermediate farm assets	141118	149486	127697	137226	178465	186236
Long-Term Farm Assets						
Farm land	107595	104505	104661	109025	122405	103352
Buildings and improvements	38597	40641	53543	51003	38092	49692
Other long-term assets	1398	1269	5000	4714	227	-
Total long-term farm assets	147591	146415	163204	164743	160724	153044
Total Farm Assets	315863	326692	311628	320424	363803	372805
Total Nonfarm Assets	33046	31278	48655	54734	31309	13865
Total Assets	348909	357970	360283	375157	395112	386670
LIABILITIES						
Current Farm Liabilities						
Accrued interest	71	434	-	347	208	1393
Accounts payable	5313	3519	6683	3277	4567	2451
Current notes	4778	6283	4520	9088	9404	7494
Government crop loans	-	-	-	-	-	-
Principal due on term debt	2150	1614	1656	-	2553	2415
Total current farm liabilities	12312	11851	12859	12712	16732	13759
Intermediate Farm Liabilities	39541	38991	30090	24785	9764	12100
Long-term Farm Liabilities	84822	86291	106357	118337	77034	74659
Total Farm Liabilities	136675	137133	149306	155834	103530	100519
Total Nonfarm Liabilities	2301	2249	1214	1253	3121	2947
Total Deferred Liabilities	-	-	-	-	-	-
Total Liabilities	138976	139382	150520	157087	106651	103466
Net Worth (farm and nonfarm)	209933	218588	209763	218070	288462	283204
Net Worth Change		8655		8307		-5258
RATIO ANALYSIS						
Current Farm Liabilities / Assets	45%	38%	62%	69%	68%	41%
Curr. & Interm Farm Liab. / Assets	31%	28%	29%	24%	13%	12%
Long Term Farm Liabilities / Assets	57%	59%	65%	72%	48%	49%
Total Liabilities / Assets	40%	39%	42%	42%	27%	27%

Table 5
STATEMENT OF CASH FLOWS, 1995
Wisconsin Dairy Grazing Analysis
University of Wisconsin Extension
(Farms sorted by Net Farm Income)

		Average Of All Farms	Average Of Low 25%	Average Of High 25%
Number of Farms		27	7	7
(a) Beginning cash balance (farm & nonfarm)		9756	5533	3215
CASH FROM OPERATING ACTIVITIES				
Gross cash farm income		132510	94918	198403
Net nonfarm income	(+)	3517	2600	-
Total cash farm expense	(-)	98182	79646	143835
Apparent family living expense	(-)	25543	8372	43500
Income and social security tax	(-)	318	-	94
(b) Cash from operations	(=)	11984	9500	10975
CASH FROM INVESTING ACTIVITIES				
Sale of breeding livestock		1909	-	6735
Sale of machinery & equipment	(+)	603	771	325
Sale of farm land	(+)	1481	-	5714
Sale of farm buildings	(+)	-	-	-
Sale of other farm assets	(+)	638	-	-
Sale of nonfarm assets	(+)	-	-	-
Purchase of breeding livestock	(-)	4469	1524	12195
Purchase of machinery & equip.	(-)	6905	5202	8462
Purchase of farm land	(-)	303	-	1167
Purchase of farm buildings	(-)	10331	11157	24555
Purchase of other farm assets	(-)	724	-	429
Purchase of nonfarm assets	(-)	-	-	-
(c) Cash from investing activities	(=)	-18100	-17112	-34033
CASH FROM FINANCING ACTIVITIES				
Money borrowed		27341	28305	60103
Cash gifts and inheritances	(+)	144	-	-
Principal payments	(-)	16848	14412	30236
Dividends paid	(-)	-	-	-
Gifts given	(-)	58	-	-
(d) Cash from financing activities	(=)	10579	13893	29867
(e) Net change in cash balance	(b+c+d)	4463	6281	6808
Ending cash balance calculated	(a+e)	14219	11814	10023

Table 6
FINANCIAL GUIDELINE MEASURES, 1995
Wisconsin Dairy Grazing Analysis
University of Wisconsin Extension
(Farms sorted by Net Farm Income)

	Average For All Farms		Average For Low 25 %		Average For High 25 %	
Number of Farms	27		7		7	
LIQUIDITY	Beginning	Ending	Beginning	Ending	Beginning	Ending
Current ratio	1.97	2.28	1.61	1.45	1.31	1.73
Working capital	14728	18014	7868	5743	8438	16078
SOLVENCY (Market)	Beginning	Ending	Beginning	Ending	Begining	Ending
Farm debt to asset ratio	44%	44%	48%	49%	36%	39%
Farm equity to asset ratio	56%	56%	52%	51%	64%	61%
Farm debt to equity ratio	80%	79%	92%	95%	57%	63%
PROFITABILITY (Market)						
Rate of return on farm assets	9.2%		2.8%		15.6%	
Rate of return on farm equity	10.1%		-2.1%		19.9%	
Operating profit margin	29.0%		10.6%		46.1%	
Net farm income	34388		12287		56461	
EFFICIENCY						
Asset turnover rate (market)	31.9%		26.5%		33.9%	
Operating expense ratio	63.2%		67.7%		64.4%	
Depreciation expense ratio	-1.5%		11.0%		-11.2%	
Interest expense ratio	9.7%		13.0%		8.1%	
Net farm income ratio	28.7%		8.3%		38.7%	

Table 7
FARM INCOME STATEMENT, 1995
Wisconsin Dairy Grazing Analysis -- Lower Capital vs Higher Capital
University of Wisconsin Extension
(Average of all farms reporting)

	Lower Capital Average of All Farms	Higher Capital Average of All Farms
Number of Farms	11	16
CASH FARM INCOME		
Corn	40	944
Alfalfa Hay	245	-
Mixed Hay	-	250
Oats	89	-
Background Beef	-	127
Grazing Beef	155	2151
Eggs	27	-
Milk	88030	134688
Dairy Calves	1237	1569
Dairy Heifers (for sale)	679	18
Dairy Replacement heifers	-	95
Dairy Steers	1551	-
Finish Cull Cows	-	193
Cull breeding livestock	3366	6351
Misc. livestock income	1216	974
Deficiency payments	25	1056
CRP payments	-	67
Other government payments	1425	2594
Custom work income	84	327
Patronage dividends, cash	857	628
Insurance income	156	-
Other farm income	1412	2422
Gross Cash Farm Income	100592	154453

Table 8
FARM INCOME STATEMENT, 1995 (continued)
Wisconsin Dairy Grazing Analysis - - Lower Capital vs Higher Capital
University of Wisconsin Extension
(Average of all farms reporting)

	Lower Capital Average Of All Farms	Higher Capital Average Of All Farms
Number of Farms	11	16
CASH FARM EXPENSE		
Seed	828	2458
Fertilizer	1931	2252
Crop chemicals	153	1216
Crop insurance	-	22
Crop miscellaneous	437	173
Purchased feed	22273	31034
Breeding fees	1211	1052
Veterinary	2461	4758
Livestock supplies	4133	6178
Livestock leases	204	126
Livestock marketing	2957	3472
Interest	6217	16756
Fuel & oil	1648	2879
Repairs	4298	9239
Custom hire	643	2993
Hired labor	3970	11797
Land rent	3832	2537
Machinery & bldg leases	649	333
Real estate taxes	3211	3942
Farm insurance	1201	2093
Utilities	2934	4460
Dues & professional fees	279	493
Hedging account deposits	666	-
Miscellaneous	2584	8171
Total cash expense	68721	118436
Net cash farm income	31871	36017
INVENTORY CHANGES		
Crops and feed	833	637
Market livestock	-1365	-339
Accounts receivable	270	-301
Prepaid expenses and supplies	-625	75
Accounts payable	2014	1903
Total inventory change	1127	1976
Net operating profit	32998	37993
DEPRECIATION AND OTHER CAPITAL ADJUSTMENTS		
Breeding livestock	8394	7991
Machinery and equipment	-3405	-5082
Buildings and improvements	309	-3034
Other farm capital	-850	463
Total depr. and other capital adj	4448	337
Net farm income	37446	38330

Table 9
PROFITABILITY AND LIQUIDITY ANALYSIS, 1995
Wisconsin Dairy Grazing Analyis – Lower Capital vs Higher Capital
University of Wisconsin Extension
(Average of all farms reporting)

	Lower Capital Average Of All Farms	Higher Capital Average Of All Farms
Number of Farms	11	16
PROFITABILITY (Market)		
Net farm income	37507	35274
Labor and management earnings	27634	22052
Rate of return on assets	11.1%	8.5%
Rate of return on equity	12.8%	8.7%
Operating profit margin	31.4%	27.9%
Asset turnover rate	35.4%	30.5%
Interest on farm net worth	9874	13222
Farm interest expense	6117	17415
Value of operator lbr and mgmt.	16520	16009
Return on farm assets	27105	36680
Average farm assets	244058	430523
Return on farm equity	20988	19265
Average farm equity	164559	220372
Value of farm production	86450	131408
Number of Farms	11	16
LIQUIDITY (Cash)		
Net cash farm income	31871	36017
Net nonfarm income	6588	1406
Family living and taxes	25235	26292
Real estate principal payments	381	1839
Cash available for interm. debt	12844	9293
Average intermediate debt	24989	68550
Years to turnover interm. debt	1.9	7.4
Expense as a % of income	68%	77%
Interest as a % of income	6%	11%
LIQUIDITY (Accrual)		
Total accrual farm income	100330	154451
Total accrual farm expense	67332	116458
Net accrual operating income	32998	37993
Net nonfarm income	6588	1406
Family living and taxes	25235	26292
Real estate principal payments	381	1839
Available for intermediate debt	13971	11268
Average intermediate debt	24989	68550
Years to turnover interm. debt	1.8	6.1
Expense as a % of income	67%	75%
Interest as a % of income	6%	11%

Table 10
STATEMENT OF CASH FLOWS, 1995
Wisconsin Dairy Grazing Analyis – Lower Capital vs Higher Capital
University of Wisconsin Extension
(Average of all farms reporting)

		Lower Capital Average Of All Farms	Higher Capital Average Of All Farms
Number of Farms		11	16
(a) Beginning cash balance (farm & nonfarm)		21404	1748
CASH FROM OPERATING ACTIVITIES			
Gross cash farm income		100592	154453
Net nonfarm income	(+)	6588	1406
Total cash farm expense	(-)	68721	118436
Apparent family living expense	(-)	24455	26292
Income and social security tax	(-)	780	-
(b) Cash from operations	(=)	13225	11131
CASH FROM INVESTING ACTIVITIES			
Sale of breeding livestock		3953	503
Sale of machinery & equipment	(+)	807	463
Sale of farm land	(+)	-	2500
Sale of farm buildings	(+)	-	-
Sale of other farm assets	(+)	-	1076
Sale of nonfarm assets	(+)	-	-
Purchase of breeding livestock	(-)	2695	5688
Purchase of machinery & equip.	(-)	4528	8539
Purchase of farm land	(-)	-	511
Purchase of farm buildings	(-)	2394	15788
Purchase of other farm assets	(-)	273	1034
Purchase of nonfarm assets	(-)	-	-
(c) Cash from investing activities	(=)	-5130	-27018
CASH FROM FINANCING ACTIVITIES			
Money borrowed		8279	40447
Cash gifts and inheritances	(+)	352	-
Principal payments	(-)	10469	21223
Dividends paid	(-)	-	-
Gifts given	(-)	142	-
(d) Cash from financing activities	(=)	-1980	19214
(e) Net change in cash balance	(b+c+d)	6114	3327
Ending cash balance calculated	(a+e)	27518	5075

Table 11
FINANCIAL GUIDELINES MEASURES, 1995
Wisconsin Grazing Analyis – Lower Capital vs Higher Capital
University of Wisconsin Extension
(Average of all farms reporting)

	Lower Capital Average for All Farms		Higher Capital Average for All Farms	
Number of Farms	11		16	
LIQUIDITY	Beginning	Ending	Beginning	Ending
Current ratio	3.15	6.46	1.60	1.53
Working capital	19201	28715	11654	10656
SOLVENCY (Market)	Beginning	Ending	Beginning	Ending
Farm debt to asset ratio	34%	31%	48%	49%
Farm equity to asset ratio	66%	69%	52%	51%
Farm debt to equity ratio	52%	45%	93%	98%
PROFITABILITY (Market)				
Rate of return on farm assets	11.1%		8.5%	
Rate of return on farm equity	12.8%		8.7%	
Operating profit margin	31.4%		27.9%	
Net farm income	38471		31580	
EFFICIENCY				
Asset turnover rate (market)	35.4%		30.5%	
Operating expense ratio	61.0%		64.1%	
Depreciation expense ratio	-4.4%		-0.2%	
Interest expense ratio	6.1%		11.3%	
Net farm income ratio	37.3%		24.8%	