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Staff Paper

2004 Michigan Dairy Grazing Farm Business Analysis Summary

Eric Wittenberg
And
Christopher Wolf

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Department of Agricultural Economics
MICHIGAN STATE UNIVERSITY
East Lansing, Michigan 48824

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By

Eric Wittenberg and Christopher Wolf¹

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¹ Co-workers in the TelFarm project were: R. Betz, L. Borton, B. Battel, W. Schauer, D. Stein, and V. Varner with the assistance of Michigan State University Extension Agents. Greenstone Farm Credit Services co-workers were Kelly Tobin, Steve Eshelman, Janice Raymond, Tiffany Aldrich, Anne Gerke, Kathleen Spranger, Sonya Pentecost, and Lynette Wood. Farm Credit Services of Wisconsin co-worker was Steve Zimmerman.

Executive Summary

This report summarizes the financial and production records of 10 dairy grazing farms from across Michigan. These 10 farms indicated that they grazed dairy cows at least three months of the year and that grazing provided more than 30 percent of the forage consumed during the year. To be included, the farms must have produced at least 50 percent of gross cash farm income from milk and dairy animal sales. The records came from Michigan State University's TelFarm project and the Farm Credit Service system in Michigan. The values were pooled into averages for reporting purposes. Farm records were checked for accuracy. While considerable variation in the data exists, average values are reported in the summary tables and discussion that follows.

In 2004, the average size dairy farm in the business analysis had 115 cows producing an average of 16,030 pounds of milk per cow (Table 1). Milk price, based on gross income, averaged \$16.75/cwt. The average cropped acres per cow for the 10 dairy grazing farms was 3.7.

Table 1. Average Michigan Dairy Grazing Farm Characteristics, 2000-2004

	2000	2001	2002	2003	2004
Average number of cows	84	99	111	114	115
Milk sold per cow (pounds)	15,309	15,250	15,758	16,392	16,030
Average price of milk sold (\$/cwt)	\$12.98	\$15.38	\$12.87	12.81	\$16.75
Total acres owned	187	231	400	417	342
Total crop acres	139	293	464	479	424
Cropped acres per Cow	1.7	3	4.2	4.2	3.7
Number of farms	33	14	9	9	10

Net farm income is the return to operator unpaid management, labor and capital invested. Net farm income in 2004 averaged \$77,873 (Table 2). This average was nearly five times as large as 2003, reflecting the very high 2004 milk price. The median was \$74,335 and the standard deviation was \$68,781. Gross cash farm income averaged \$357,317 in 2004. The largest component of these revenues was milk sales, which averaged \$307,714. Average total cash expenses were \$296,245 and average net cash farm income was \$61,072. Inventory changes were \$36,288 while depreciation and capital adjustments averaged a negative \$19,486.

Table 2. Average Michigan Dairy Grazing Farm Income Statement, 2000-2004

	2000	2001	2002	2003	2004
			(\$)		
Gross cash farm income	204,526	277,512	277,302	297,148	357,317
- Total cash expense	<u>146,635</u>	<u>209,019</u>	<u>237,264</u>	<u>262,301</u>	<u>296,245</u>
= Net cash farm income	57,892	68,493	40,038	34,847	61,072
+ Inventory change*	4,017	-2,389	-1,766	-3,637	36,288
+ Depreciation + capital adjustments*	<u>-6,681</u>	<u>-21,234</u>	<u>-21,326</u>	<u>-14,060</u>	<u>-19,486</u>
= Net farm income	55,228	44,871	16,945	17,150	77,873

*Changes calculated as ending value minus beginning value.

To put the profit values in perspective, we calculate profitability ratios. Rate of return on assets (ROA) is the farm operating profit (equal to net farm income plus interest expense less value of operator labor and management) divided by average total farm asset value (valued at current market value). Rate of return on assets is a measure of how much profit the farm business assets generated. The average 2004 dairy farm ROA (Market) was 5.2 percent, which was an improvement over 2003, 2002 and 2001 (Table 3). Return on equity tells a similar story. Operating profit margin is the operating profit (as defined in ROA above) divided by gross revenues. Operating profit margin measures the dollars of profit generated per dollar of revenue. In 2004, Michigan dairy grazing farms generated 20.9 cents of profit per dollar of revenue. Asset turnover is the gross farm revenues divided by average asset value. Asset turnover measures the efficiency with which farm assets generate revenue. This value declined slightly in 2004 to an average of 24.8 percent.

Table 3. Average Michigan Dairy Grazing Farm Profitability Indicators, 2000-2004

	2000	2001	2002	2003	2004
	(percent)				
Rate of return on assets*	5.3	2.4	-2.8	0.1	5.2
Rate of return on equity	4.6	-0.5	-9.3	-1.4	5.7
Operating profit margin	11.2	5.1	-7.3	0.6	20.9
Asset turnover rate*	46.9	47.1	38.8	25.7	24.8

* Assets valued at market value

Per Unit Income and Expenses

Table 4 displays average income and expenses items per hundredweight (cwt.) of milk and per cow across 10 dairy grazing farms. Both income and expenses were adjusted to an accrual basis where detailed financial information was provided. Average, accrual adjusted income and expenses per cropped acre are also included.

Income items related to the dairy herd are included in the first section. Government payments include all farm government payments—not just those related to the dairy herd. It was not possible to separate crop payments from dairy payments. *This table should not be interpreted as an estimate of the true cost of producing milk.* All farm sales are not included in the income items—only those that are related to the milking herd. Also, unpaid factors, including labor, management and capital, are not accounted for in the expense items. In addition, the allocation of resources amongst farm enterprises is not accurately reflected leaving the milking herd as the residual claimant on all expenses (especially labor costs).

The largest expense was purchased feed at \$5.16/cwt. and hired labor was the second largest at \$1.51/cwt. Repairs and milk marketing and trucking combined were also significant expenses for 2004

The bottom of Tables 4 presents crop related expenses divided by the total cropped acres. To accurately calculate a crop cost of production requires labor and management (among other) expenses that were not separated out in the financial records.

Table 4. Average income and expenses across all Grazing farms*, 2004

Income Items:	Per cwt.	Per Cow
Milk	\$16.75	\$2,661.89
Cull Cows and Calves	\$1.06	\$165.36
Dairy Steers	\$0.45	\$58.33
Dairy Heifers	\$0.12	\$20.28
Government Payments	\$0.63	\$101.92
Patronage Dividends, cash	\$0.03	\$5.31
Crop Sales	\$0.32	\$54.87
Other Cash Income	\$0.24	\$33.88
Expense Items:	Per cwt.	Per Cow
Purchased Feeds	\$5.16	\$815.14
Breeding Fees	\$ 0.15	\$24.70
Veterinary	\$0.47	\$69.29
BST	N/A	N/A
Livestock Supplies	\$0.89	\$137.30
DHIA	\$0.02	\$3.49
Milk & Livestock Mkt. & Trucking	\$0.77	\$122.33
Interest	\$0.70	\$109.72
Fuel and Oil	\$0.62	\$94.77
Repairs	\$1.34	\$204.94
Custom Hire	\$0.55	\$92.94
Hired Labor	\$1.51	\$236.56
Leases	\$0.10	\$17.13
Real Estate Taxes	\$0.35	\$55.31
Farm Insurance	\$0.32	\$50.97
Utilities	\$0.51	\$77.54
Dues, Professional Fees	\$0.12	\$18.04
Miscellaneous	\$0.50	\$83.37
Machinery Depreciation	\$1.56	\$253.57
Building Depreciation	\$0.41	\$61.34
Expense Items per Cropped Acre:	Per Acre	
Seed	\$19.13	
Fertilizer	\$28.02	
Crop Chemicals	\$7.43	
Crop Insurance	\$0.24	
Crop Miscellaneous	\$4.43	
Land Rent	\$12.60	

* All income and expense items averaged across all 10 farms whether they had this income or expense item or not. Other cash income includes custom work, insurance claims, and miscellaneous income.

Table 5

Crop Production and Marketing Summary
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Dairy	
Number of farms	10
Average number of Cows	115
Milk production per Cow, lbs.	16,030
Average milk price per cwt.,	\$16.75
Acreage Summary	
Total acres owned	342
Total crop acres	424
Crop acres owned	257
Crop acres cash rented	167
Crop acres share rented	-
Total pasture acres	28

Average Price Received (Cash Sales Only)

Table 6

Farm Income Statement
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Cash Farm Income	
Hay, Mixed	3,857
Soybeans	1,117
Wheat, Winter	685
Miscellaneous crop income	25
Beef, Finish Beef Calves	1,910
Dairy, Milk	307,714
Dairy, Dairy Calves	1,449
Dairy Heifers (for sale)	510
Dairy Replacement Heifers	1,770
Dairy Steers	3,730
Beef Cow-Calf (shares), Beef Calv	137
Cull breeding livestock	18,044
Misc. livestock income	11
Direct & CC govt payments	2,797
Other government payments	10,103
Custom work income	514
Patronage dividends, cash	554
Other farm income	2,391
Gross Cash Farm Income	357,317

Table 6

Farm Income Statement (Continued)
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Cash Farm Expense	
Seed	6,164
Fertilizer	12,070
Crop chemicals	2,839
Crop insurance	99
Irrigation energy	226
Crop custom hire	1,469
Crop hauling and trucking	100
Purchased feed	94,382
Breeding fees	2,503
Veterinary	7,877
Supplies	14,081
DHIA	418
Livestock utilities	978
Livestock hauling and trucking	3,420
Marketing	9,406
Livestock miscellaneous	425
Interest	12,910
Packaging and supplies	1,229
Fuel & oil	11,089
Repairs	26,377
Custom hire	12,553
Hired labor	31,052
Land rent	7,381
Machinery & bldg leases	2,738
Real estate taxes	6,824
Farm insurance	6,027
Utilities	7,684
Dues & professional fees	1,764
Miscellaneous	12,158
Total cash expense	296,245
Net cash farm income	61,072
Inventory Changes	
Crops and feed	16,569
Market livestock	1,096
Accounts receivable	7,738
Prepaid expenses and supplies	2,739
Accounts payable	8,146
Total inventory change	36,288
Net operating profit	97,359
Depreciation and Other Capital Adjustments	
Breeding livestock	10,771
Machinery and equipment	-24,037
Buildings and improvements	-6,390
Other farm capital	170
Total depr. and other capital adj	-19,486
Net farm income	77,873

Table 7

Inventory Changes
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Net cash farm income	61,072
Crops and Feed	
Ending inventory	68,445
Beginning inventory	51,876
Inventory change	16,569
Market Livestock	
Ending inventory	5,299
Beginning inventory	4,203
Inventory change	1,096
Accts Receivable & Other Current Assets	
Ending inventory	21,883
Beginning inventory	14,145
Inventory change	7,738
Prepaid Expenses and Supplies	
Ending inventory	8,567
Beginning inventory	5,828
Inventory change	2,739
Accounts Payable & Accrued Expenses	
Beginning inventory	18,689
Ending inventory	10,543
Inventory change	8,146
Total inventory change	36,288
Net operating profit	97,359

Table 8

Depreciation and Other Capital Adjustments
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Net operating profit	97,359
Breeding Livestock	
Ending inventory	235,217
Capital sales	89
Beginning inventory	224,445
Capital purchases	90
Depreciation, capital adjust.	10,771
Machinery and Equipment	
Ending inventory	74,907
Capital sales	807
Beginning inventory	60,808
Capital purchases	38,943
Depreciation, capital adjust.	-24,037
Buildings and Improvements	
Ending inventory	65,949
Capital sales	-
Beginning inventory	31,960
Capital purchases	40,379
Depreciation, capital adjust.	-6,390
Other Capital Assets	
Ending inventory	16,626
Capital sales	1,003
Beginning inventory	15,703
Capital purchases	1,756
Depreciation, capital adjust.	170
Total depreciation, capital adj.	-19,486
Net farm income	77,873

Table 9

Profitability Measures
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Profitability (assets valued at cost)	
Net farm income	77,873
Labor and management earnings	52,176
Rate of return on assets	6.8 %
Rate of return on equity	9.0 %
Operating profit margin	17.0 %
Asset turnover rate	40.0 %
Interest on farm net worth	25,698
Farm interest expense	12,344
Value of operator lbr and mgmt.	39,375
Return on farm assets	50,842
Average farm assets	748,292
Return on farm equity	38,498
Average farm equity	428,296
Value of farm production	299,109
	Avg. Of All Farms
Number of farms	10
Profitability (assets valued at market)	
Net farm income	89,408
Labor and management earnings	36,341
Rate of return on assets	5.2 %
Rate of return on equity	5.7 %
Operating profit margin	20.9 %
Asset turnover rate	24.8 %
Interest on farm net worth	53,067
Farm interest expense	12,344
Value of operator lbr and mgmt.	39,375
Return on farm assets	62,376
Average farm assets	1,204,446
Return on farm equity	50,033
Average farm equity	884,451
Value of farm production	299,109

Table 10

Liquidity Measures

2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Liquidity (cash)	
Net cash farm income	61,072
Net nonfarm income	2,831
Family living and taxes	29,802
Principal due on long term debt	6,910
Cash available for interm. debt	27,190
Average intermediate debt	76,582
Years to turnover interm. debt	2.8
Expense as a % of income	83 %
Interest as a % of income	4 %
Liquidity (accrual)	
Total accrual farm income	382,720
Total accrual operating expense	285,360
Net accrual operating income	97,359
Net nonfarm income	2,831
Family living and taxes	29,802
Principal due on long term debt	6,910
Available for intermediate debt	63,478
Average intermediate debt	76,582
Years to turnover interm. debt	1.2
Expense as a % of income	75 %
Interest as a % of income	3 %

Table 11

Balance Sheet at Cost Values
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms	
Number of farms	10	
	Beginning	Ending
Assets		
Current Farm Assets		
Cash and checking balance	4,065	8,698
Prepaid expenses & supplies	5,828	8,567
Growing crops	7,334	7,975
Accounts receivable	6,812	13,419
Hedging accounts	0	489
Crops held for sale or feed	51,876	68,445
Crops under government loan	0	0
Market livestock held for sale	4,203	5,299
Other current assets	0	0
Total current farm assets	80,116	112,892
Intermediate Farm Assets		
Breeding livestock	224,445	235,217
Machinery and equipment	59,808	73,907
Titled vehicles	1,000	1,000
Other intermediate assets	4,534	5,292
Total intermediate farm assets	289,787	315,416
Long Term Farm Assets		
Farm land	250,740	327,220
Buildings and improvements	31,960	65,949
Other long-term assets	11,169	11,334
Total long-term farm assets	293,869	404,503
Total Farm Assets	663,772	832,811
Total Nonfarm Assets	45,353	60,146
Total Assets	709,125	892,957
Liabilities		
Current Farm Liabilities		
Accrued interest	2,235	1,669
Accounts payable	16,454	8,874
Current notes	21,791	16,006
Government crop loans	0	0
Principal due on term debt	27,631	22,667
Total current farm liabilities	68,111	49,217
Total intermediate farm liabs	50,623	68,123
Total long term farm liabilities	139,313	264,605
Total farm liabilities	258,047	381,944
Total nonfarm liabilities	1,360	803
Total liabilities	259,407	382,747
Net worth (farm and nonfarm)	449,718	510,210
Net worth change		60,492
Ratio Analysis		
Current farm liabilities / assets	85 %	44 %
Curr. & interm farm liab. / assets	32 %	27 %
Long term farm liab. / assets	47 %	65 %
Total debt to asset ratio	37 %	43 %

Table 12

Balance Sheet at Market Values
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms	
Number of farms	10	
	Beginning	Ending
Assets		
Current Farm Assets		
Cash and checking balance	4,065	8,698
Prepaid expenses & supplies	5,828	8,567
Growing crops	7,334	7,975
Accounts receivable	6,812	13,419
Hedging accounts	0	489
Crops held for sale or feed	51,876	68,445
Crops under government loan	0	0
Market livestock held for sale	4,203	5,299
Other current assets	0	0
Total current farm assets	80,116	112,892
Intermediate Farm Assets		
Breeding livestock	226,260	237,085
Machinery and equipment	157,460	180,029
Titled vehicles	885	2,456
Other intermediate assets	4,859	5,367
Total intermediate farm assets	389,464	424,937
Long Term Farm Assets		
Farm land	514,856	592,136
Buildings and improvements	116,055	150,934
Other long-term assets	13,669	13,834
Total long-term farm assets	644,580	756,903
Total Farm Assets	1,114,160	1,294,733
Total Nonfarm Assets	164,482	184,625
Total Assets	1,278,642	1,479,357
Liabilities		
Current Farm Liabilities		
Accrued interest	2,235	1,669
Accounts payable	16,454	8,874
Current notes	21,791	16,006
Government crop loans	0	0
Principal due on term debt	27,631	22,667
Total current farm liabilities	68,111	49,217
Total intermediate farm liab	50,623	68,123
Total long term farm liabilities	139,313	264,605
Total farm liabilities	258,047	381,944
Total nonfarm liabilities	1,360	803
Total liab excluding deferreds	259,407	382,747
Total deferred liabilities	0	0
Total liabilities	259,407	382,747
Retained earnings	449,718	510,210
Market valuation equity	569,517	586,400
Net worth (farm and nonfarm)	1,019,235	1,096,610
Net worth excluding deferreds	1,019,235	1,096,610
Net worth change		77,375
Ratio Analysis		
Current farm liabilities / assets	85 %	44 %
Curr. & interm farm liab. / assets	25 %	22 %
Long term farm liab. / assets	22 %	35 %
Total debt to asset ratio	20 %	26 %
Debt to assets excl deferreds	20 %	26 %

Table 13

Statement Of Cash Flows
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Beginning cash (farm & nonfarm)	4,065
Cash From Operating Activities	
Gross cash farm income	357,317
Net nonfarm income	2,831
Total cash farm expense	-296,245
Apparent family living expense	-28,532
Income and social security tax	-1,271
Cash from operations	34,100
Cash From Investing Activities	
Sale of breeding livestock	89
Sale of machinery & equipment	807
Sale of titled vehicles	-
Sale of farm land	8,201
Sale of farm buildings	-
Sale of other farm assets	1,003
Sale of nonfarm assets	273
Purchase of breeding livestock	-90
Purchase of machinery & equip.	-37,143
Purchase of titled vehicles	-1,800
Purchase of farm land	-77,280
Purchase of farm buildings	-40,379
Purchase of other farm assets	-1,756
Purchase of nonfarm assets	-15,300
Cash from investing activities	-163,374
Cash From Financing Activities	
Money borrowed	180,850
Cash gifts and inheritances	4,672
Principal payments	-49,364
Dividends paid	-
Gifts given	-2,250
Cash from financing activities	133,908
Net change in cash balance	4,634
Ending cash (farm & nonfarm)	8,698

Table 14

Financial Standards Measures
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Liquidity	
Current ratio	2.29
Working capital	63,675
Solvency (market)	
Farm debt to asset ratio	29 %
Farm equity to asset ratio	71 %
Farm debt to equity ratio	42 %
Profitability (cost)	
Rate of return on farm assets	6.8 %
Rate of return on farm equity	9.0 %
Operating profit margin	17.0 %
Net farm income	77,873
Repayment Capacity	
Term debt coverage ratio	205 %
Capital replacement margin	42,206
Efficiency	
Asset turnover rate (cost)	40.0 %
Operating expense ratio	71.3 %
Depreciation expense ratio	5.1 %
Interest expense ratio	3.2 %
Net farm income ratio	20.3 %

Table 15

Operator and Labor Information
2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Operator Information	
Average number of operators	1.3
Average age of operators	56.8
Average number of years farming	32.0
Results Per Operator	
Working capital	48,981
Total assets (market)	1,137,967
Total liabilities	294,421
Net worth (market)	843,546
Net worth excl deferred liabs	843,546
Gross farm income	294,400
Total farm expense	234,497
Net farm income	59,903
Net nonfarm income	2,178
Family living & tax withdrawals	22,925
Total acres owned	262.8
Total crop acres	326.3
Crop acres owned	197.6
Crop acres cash rented	128.7
Crop acres share rented	-
Total pasture acres	21.2
Labor Analysis	
Number of farms	10
Total unpaid labor hours	3,752
Total hired labor hours	2,380
Total labor hours per farm	6,132
Unpaid hours per operator	2,886
Value of farm production / hour	48.78
Net farm income / unpaid hour	20.76
Average hourly hired labor wage	13.01

Table 16

Financial Summary

2004 Dairy Grazing Business Analysis Summary
(Farms Sorted By Rate of Return on Assets - Mkt)

	Avg. Of All Farms
Number of farms	10
Income Statement	
Gross cash farm income	357,317
Total cash farm expense	296,245
Net cash farm income	61,072
Inventory change	36,288
Depreciation and capital adjust	-19,486
Net farm income	77,873
Profitability (cost)	
Labor and management earnings	52,176
Rate of return on assets	6.8 %
Rate of return on equity	9.0 %
Operating profit margin	17.0 %
Asset turnover rate	40.0 %
Profitability (market)	
Labor and management earnings	36,341
Rate of return on assets	5.2 %
Rate of return on equity	5.7 %
Operating profit margin	20.9 %
Asset turnover rate	24.8 %
Liquidity	
Ending current ratio	2.29
Ending working capital	63,675
End working capital to gross inc	17.8 %
Term debt coverage ratio	204.7 %
Expense as a percent of income	74.6 %
Interest as a percent of income	3.2 %
Solvency (cost)	
Number of farms	10
Ending farm assets	832,811
Ending farm liabilities	381,944
Ending total assets	892,957
Ending total liabilities	382,747
Ending net worth	510,210
Net worth change	60,492
Ending farm debt to asset ratio	46 %
Beg total debt to asset ratio	37 %
End total debt to asset ratio	43 %
Solvency (market)	
Number of farms	10
Ending farm assets	1,294,733
Ending farm liabilities	381,944
Ending total assets	1,479,357
Ending total liabilities	382,747
Ending net worth	1,096,610
Net worth change	77,375
Ending farm debt to asset ratio	29 %
Beg total debt to asset ratio	20 %
End total debt to asset ratio	26 %
Nonfarm Information	
Net nonfarm income	2,831
Crop Acres	
Total acres owned	342
Total crop acres	424
Total crop acres owned	257
Total crop acres cash rented	167
Total crop acres share rented	-