

# **DAIRY FARM BUSINESS SUMMARY**

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## ***NEW YORK LARGE HERD FARMS, 300 COWS OR LARGER, 2016***



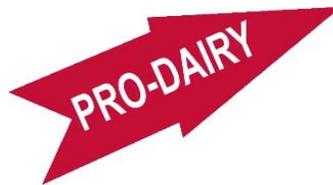
***You can't manage what you can't measure  
but if you measure it you can improve it!***

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**2016 DAIRY FARM BUSINESS SUMMARY  
LARGE HERD DAIRY FARMS  
300 Cows or Larger**

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# 2016 DAIRY FARM BUSINESS SUMMARY AND ANALYSIS

## LARGE HERD DAIRY FARMS<sup>1</sup>

### INTRODUCTION

Dairy farmers throughout New York State have been participating in Cornell Cooperative Extension Farm Business Summary and Analysis Programs since the early 1950's. Managers of each participating farm business receive a comprehensive summary and analysis of the farm business.

Larger farms employ different technologies and management systems, and thus, achieve different efficiencies than smaller farms. This makes comparisons of a large farm's performance to the average of farms of all sizes not as meaningful as comparing to the average of similar sized farms. This report contains a summary and analysis of dairy farms with 300 or more cows. In addition, farms are sorted into three categories for many comparisons, 300 to 799 cows, 800 to 1,199 cows, and 1,200 and more cows per farm.

Farm managers should determine their business performance and then compare it with that of other similar farms. In this manner, strengths and areas for improvement can be identified. A goal that many managers set is to strive to be in the top 20 percent of farms for many of the production and financial benchmarks. Each manager should select and then revise annually the goals which their business strives to achieve.

#### **Program Objective**

The primary objective of the Dairy Farm Business Summary and Analysis Project, DFBS, is to help farm managers improve the business and financial management of their dairy farm through appropriate use of historical farm data and the application of modern farm business analysis techniques. This information can also be used to track changes within the business, establish goals that will enable the business to better meet its objectives, compare the performance of the farm to other dairy producers, and establish a basis for financial projection of planned changes within the business.

#### **Format**

This report is comprised of six sections. The first section charts the progress of the large herd farm business over two years. One hundred and twelve large herd farms participated in the summary the last two years. The averages of selected business factors are presented for these farms and the changes that occurred from 2015 to 2016 are calculated.

The second section contains charts for additional analysis of large herd farms. The top 20 percent large farms (by rate of return on assets without appreciation) are compared to the average for all 113 large herd farms that participated in the 2016 DFBS program. Also presented is information concerning dairy enterprise efficiency, and milking parlor efficiency.

The summary and analysis section lists the average data for the 113 large herd farms that participated in the 2016 DFBS program. The format follows that of the individual farm DFBS printout and contains a brief explanation of each table and chart with comparisons to the top 20 percent large farms.

The fourth section presents a condensed summary and selected business factors for farms with 300-799 cows, 800-1,199 cows, and farms with 1,200 and more cows.

The fifth section contains the income and expense profiles for the 300-799 cow farms, 800-1,199 cow farms, and 1,200 and more cow farms on a per cow and per hundredweight of milk basis.

The sixth section contains business charts for key measures of farm performance.

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<sup>1</sup>The large herd summary is comprised of farms with 300 or more cows. Albany, Cayuga, Chautauqua, Chenango, Clinton, Cortland, Delaware, Erie, Genesee, Jefferson, Lewis, Livingston, Madison, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Otsego, Rensselaer, Saratoga, Schuyler, St. Lawrence, Tompkins, Washington, and Wyoming counties had farms of this size participating in 2016. This report was written by Jason Karszes, Senior Extension Associate, Pro-Dairy and Wayne A. Knoblauch, Professor, Farm Management. Cathryn Dymond was in charge of data and publication preparation. Data were collected by Cornell Cooperative Extension educators across the state. We also acknowledge the cooperation of Farm Credit East Association; and Dehm Associates, for their assistance in data collection.

## PROGRESS OF THE FARM BUSINESS

The 2016 business year for the New York State dairy industry was similar to 2015, a second year of lower milk prices, changing cost structures and challenging growing conditions. Milk prices fell more from 2015, but costs also continued to decline. Herd size continued to grow and along with a significant increase in milk production per cow, led to increase milk marketed off the farm. With the combination of changes during the year, a decrease in profits occurred, resulting in slightly negative to no change in the financial position of the average farm over 300 cows in New York.

For both 2015 and 2016, 111 farms that averaged more than 300 cows in New York participated in the Dairy Farm Business Summary and Analysis Program (DFBS), administered by Cornell Cooperative Extension and Cornell University. The tables on the following two pages show selected factors and receipts and expenses, per cow and per hundredweight from the same 111 farms that participated in the DFBS project each of the last two years.

**Milk Income.** Gross milk prices decreased 7.0 percent to \$17.05 per hundredweight, a decrease of \$1.28, resulting in the lowest gross milk price received on farm since 2009. Milk marketing expenses increased by \$0.01 per hundredweight, leading to a decrease of \$1.29 in net milk price received on farms. Milk production per cow increased 3.0 percent to 26,546 pounds per cow, with participating farms indicating that forage quality improvements led to the increase in milk production. With the increase in milk production offsetting some of the decrease in milk price, gross milk revenue per cow decreased 4.2 percent from the previous year. Average herd size for the participating farms increased by 4.9 percent to 1,097 cows. With both herd size and milk per cow increasing, total milk pounds shipped per farm increased by 8.1 percent. 2016 presented different growing conditions than 2015, with wet conditions becoming dry conditions around different parts of the state. Hay yields decreased 5.9 percent and corn silage yields decreased 3.9 percent. Along with milk prices falling back, cattle prices decreased significantly, with cattle sales per cow falling 15.5 percent and dairy calf sales per cow decreasing 53.9 percent.

**Cost Control.** Costs continued to decrease on the participating farms. Purchased grain and concentrates led the decrease, decreasing \$0.85 per hundredweight to \$5.77 per cwt. Fuel decreased 14 cents per cwt. Machinery repair and land, building, fence repair declined a combined 18 cents per cwt. With producers focused on cost control, coupled with increase cow numbers and higher milk production, every expense item was either unchanged or lower than last year.

Worker equivalents increased 2.2 percent, but with the increase in cow numbers, cows per worker increased 2.6 percent to 46.7 cows per worker. With both cows per worker and milk sold per cow increasing, milk sold per worker equivalent increased significantly to 1,238,589 pounds, a 5.7% increase. This increase in milk sold per worker was higher than the increase in the average cost per hired worker of 0.8 percent, leading to a decrease of 4.3 percent in hired labor cost per cwt.

The combination of these changes led to a decrease in farm operating costs of \$1.82, or 9.5 percent, to \$17.24 per hundredweight.

**Capital Investment.** The average investment in the farm increased 0.2 percent to \$11,866 per cow. The additional investments in the farm were offset by the increase in cow numbers, leading to the small change in investment per cow. The additional investment resulted in total depreciation (machinery and real estate) expenses increasing by \$17 per cow, but only \$0.02 cents per hundredweight due to the increase in milk sold per cow.

**Decrease in Earnings.** Profits fell in 2016, the second year of decreasing profits. The declines in milk prices and cow and calf revenue was only partially offset by the decrease in costs. This decrease in margin resulted in low to negative earnings for the year. Net farm income without appreciation fell to \$209,440. Net farm income with appreciation decreased to \$440,959.

- Labor and management income per operator/manager decreased 19.5 percent, from -\$74,452 in 2015 to -\$92,509 in 2016.
- Rate of return to all capital without appreciation decreased to 1.25 percent, from 1.42 percent in 2015. Rate of return on equity capital without appreciation fell to 0.13 percent.
- Farm net worth increased by 1.5 percent.
- Debt to asset ratio increased from 0.32 to 0.34, reflecting the increased borrowings for capital investment that is reflected in the 3.0 percent increase in debt per cow.

Overall, 2016 was a year of very low to slightly negative earnings and is the lowest earnings since 2009 for the average dairy farm over 300 cows in New York. While, on average, farms generate low earnings in 2016, the changes on individual farms varied, with some farms still reporting strong earnings, with changes to operating costs, milk production, and growing conditions offsetting much of the decrease in milk prices, cow, and calf revenue.

The importance of trend analysis is to identify what areas changed, ask why they changed, and look at what you can do differently in the future to influence that change. Comparing your business' performance with average data from these DFBS dairy farms can help you establish goals for your business. It is equally important to determine the progress your business has made over the past two or three years, to compare this progress to your goals, and to set goals for the future. If you would like help in developing and looking at the trends in your business, contact your local extension office and become involved in a financial management education program.

**PROGRESS OF THE FARM BUSINESS**  
Same 111 Large Herd Dairy Farms, 2015 & 2016

Selected Factors	Average of 111 Farms		Percent Change
	2015	2016	
<u>Size of Business</u>			
Average number of cows	1,046	1,097	4.9
Average number of heifers	897	953	6.2
Milk sold, lbs.	26,953,190	29,131,615	8.1
Worker equivalent	23.0	23.5	2.2
Total tillable acres	2,047	2,143	4.7
<u>Rates of Production</u>			
Milk sold per cow, lbs.	25,778	26,546	3.0
Butterfat per cow, lbs. <sup>2</sup>	982	1,013	3.2
Protein per cow, lbs. <sup>2</sup>	798	827	3.6
Hay DM per acre, tons	3.4	3.2	-5.9
Corn silage per acre, tons	17.9	17.2	-3.9
<u>Labor Efficiency &amp; Costs</u>			
Cows per worker	45.5	46.7	2.6
Milk sold per worker, lbs.	1,171,369	1,238,589	5.7
Hired labor cost per cwt.	\$3.05	\$2.92	-4.3
Hired labor cost per worker	\$40,668	\$41,001	0.8
Hired labor cost as % of milk sales	16.7%	17.2%	3.0
<u>Cost Control</u>			
Grain & concentrate purchased as % of milk sales	36%	34%	-5.6
Grain & concentrate per cwt. milk	\$6.62	\$5.77	-12.8
Dairy feed & crop expense per cwt. milk	\$8.28	\$7.26	-12.3
Labor & machinery costs per cow	\$1,755	\$1,686	-3.9
Total farm operating costs per cwt. sold	\$19.73	\$18.52	-6.1
Interest costs per cwt. milk	\$0.46	\$0.52	13.0
Operating cost of producing cwt. of milk	\$15.79	\$14.69	-7.0
Net milk income over purchased feed costs per cow	\$2,772	\$2,741	-1.1
<u>Capital Efficiency</u> (average for the year)			
Farm capital per cow	\$11,863	\$11,886	0.2
Machinery & equipment per cow	\$1,967	\$1,933	-1.7
Asset turnover ratio	0.50	0.46	-8.0
<u>Income Generation</u>			
Gross milk sales per cow	\$4,725	\$4,527	-4.2
Gross milk sales per cwt.	\$18.33	\$17.05	-7.0
Net milk sales per cwt.	\$17.38	\$16.09	-7.4
Dairy cattle sales per cow	\$489	\$413	-15.5
Dairy calf sales per cow	\$115	\$53	-53.9
<u>Profitability</u>			
Net farm income without appreciation	\$246,521	\$209,440	-15.0
Net farm income with appreciation	\$572,376	\$440,959	-23.0
Labor & mgt. income per operator/manager	\$-74,452	\$-92,509	-19.5
Rate of return on equity capital w/o appreciation	0.62%	0.13%	-79.0
Rate of return on all capital without appreciation	1.42%	1.25%	-12.0
<u>Financial Summary (excluding deferred taxes)</u>			
Farm net worth, end year	\$8,647,903	\$8,778,236	1.5
Debt to asset ratio	0.32	0.34	6.3
Farm debt per cow	\$3,891	\$4,009	3.0

<sup>2</sup>Average of 101 large herd dairy farms that provided this data for both years.

**RECEIPTS AND EXPENSES PER COW AND PER HUNDREDWEIGHT**  
Same 111 Large Herd Dairy Farms, 2015 & 2016

Item	2015		2016	
	Per Cow	Per Cwt.	Per Cow	Per Cwt.
Average number of cows	1,046		1,097	
Cwt. of milk sold		269,532		291,316
<b><u>ACCRUAL OPERATING RECEIPTS</u></b>				
Milk	\$4,725	\$18.33	\$4,527	\$17.05
Dairy cattle	489	1.90	413	1.56
Dairy calves	115	0.45	53	0.20
Other livestock	16	0.06	12	0.04
Crops	102	0.40	73	0.28
Miscellaneous receipts	<u>144</u>	<u>0.56</u>	<u>161</u>	<u>0.61</u>
Total Receipts	\$5,591	\$21.69	\$5,239	\$19.74
<b><u>ACCRUAL OPERATING EXPENSES</u></b>				
Hired labor	\$ 787	\$ 3.05	\$ 776	\$ 2.92
Dairy grain & concentrate	1,707	6.62	1,532	5.77
Dairy roughage	85	0.33	90	0.34
Nondairy feed	0	0.00	0	0.00
Professional nutritional services	1	0.00	2	0.01
Machine hire, rent & lease	135	0.52	128	0.48
Machine repair & vehicle expense	254	0.99	237	0.89
Fuel, oil & grease	148	0.57	113	0.43
Replacement livestock	9	0.03	10	0.04
Breeding	55	0.22	56	0.21
Veterinary & medicine	177	0.69	170	0.64
Milk marketing	246	0.95	255	0.96
Bedding	101	0.39	97	0.37
Milking supplies	98	0.38	91	0.34
Cattle lease	4	0.02	3	0.01
Custom boarding	110	0.43	105	0.39
bST expense	46	0.18	32	0.12
Livestock professional fees	15	0.06	15	0.06
Other livestock expense	22	0.09	17	0.06
Fertilizer & lime	147	0.57	113	0.42
Seeds & plants	127	0.49	122	0.46
Spray & other crop expense	61	0.24	63	0.24
Crop professional fees	6	0.02	9	0.03
Land, building, fence repair	92	0.36	74	0.28
Taxes	62	0.24	64	0.24
Real estate rent/lease	77	0.30	76	0.29
Insurance	59	0.23	46	0.17
Utilities	100	0.39	88	0.33
Interest paid	117	0.46	137	0.52
Other professional fees	32	0.12	28	0.10
Miscellaneous	<u>32</u>	<u>0.12</u>	<u>27</u>	<u>0.10</u>
Total Operating Expenses	\$4,914	\$19.06	\$4,577	\$17.24
Expansion livestock	22	0.08	36	0.14
Extraordinary expense	2	0.01	0	0.00
Machinery depreciation	243	0.94	248	0.93
Real estate depreciation	<u>175</u>	<u>0.68</u>	<u>187</u>	<u>0.71</u>
Total Expenses	\$5,356	\$20.77	\$5,048	\$19.02
Net Farm Income Without Appreciation	\$ 236	\$ 0.91	\$ 191	\$ 0.72

**TOP 20 PERCENT COMPARISON TO AVERAGE AND FACTORS CONCERNING  
DAIRY ENTERPRISE AND PARLOR EFFICIENCY**

In 2016, 14 farms across all herd sizes filled out a supplementary data collection form in order to gain information on additional performance factors for dairy farms. Reported below are the averages and business charts for these factors. Each category is sorted independently; therefore farms that are the highest or lowest in one column may not necessarily be the highest or lowest in the next column. Please note that this is only descriptive data from 14 farms and only represents these 14 farms. See the Glossary beginning on page 51 for definitions of the factors in the table below.

On the following page selected factors for the top 20 percent of large herd farms as sorted by rate of return on all assets without appreciation are compared to the same factors for the average of all 113 Farms over 300 cows that participated in the DFBS project in 2016. It is useful to see what factors are different between the average and the top 20% and to ask questions about where your own business fits into these factors.

All twenty two farms that were in the top 20 percent in 2016 were also in the summary in 2015. The table on page 7 shows income and expenses for these farms for both 2015 and 2016. Identifying the changes that occurred on these farms provides insight into what happened on the most profitable farms. How your farm changed in comparison should provide valuable management information.

**SUPPLEMENTAL FARM BUSINESS CHART**  
14 Dairy Farms, 2016

Milking System Only			
Quintile	Pounds of Milk Harvested Per Hour of Milking Labor	Total Cows Milked Per Hour of Milking Labor Per Day	Pounds of Milk Harvested per Machine Per Year
Average of			
Highest Third	3,796	52.7	1,105,765
Middle Third	1,680	23.3	684,370
Lowest Third	1,298	18.2	487,643
Overall Average	2,300	31.9	744,639
Dairy Enterprise Only			
Quintile	Worker Equivalents	Cows per Worker Equivalent	Pounds Sold per Worker Equivalent
Average of			
Highest Third	11.2	153	4,161,286
Middle Third	7.0	107	2,736,159
Lowest Third	3.1	80	2,135,358
Overall Average	7.1	114	3,030,561

**TOP 20 PERCENT VERSUS AVERAGE**  
113 large Herd Dairy Farms, 2016

Selected Factors	Average 113 Farms	Average Top 20% Farms <sup>4</sup>	Percent Difference
<u>Size of Business</u>			
Average number of cows	1,111	1,175	5.8
Average number of heifers	969	1,013	4.5
Milk sold, lbs.	29,482,356	31,090,110	5.5
Worker equivalent	23.7	23.8	0.4
Total tillable acres	2,151	2,176	1.2
<u>Rates of Production</u>			
Milk sold per cow, lbs.	26,536	26,454	-0.3
Butterfat per cow, lbs. <sup>3</sup>	1,011	1,013	0.2
Protein per cow, lbs. <sup>3</sup>	825	827	0.4
Hay DM per acre, tons	3.2	3.4	6.3
Corn silage per acre, tons	17.2	18.2	5.8
<u>Labor Efficiency &amp; Costs</u>			
Cows per worker	47	49	4.3
Milk sold/worker, lbs.	1,243,369	1,305,576	5.0
Hired labor cost/cwt.	\$2.93	\$2.70	-7.9
Hired labor cost/hired worker	\$41,100	\$39,382	-4.2
Hired labor cost as % of milk sales	17.2%	15.6%	-9.3
<u>Cost Control</u>			
Grain & concentrate purchased as % of milk sales	34%	33%	-2.9
Grain & concentrate per cwt. milk	\$5.75	\$5.59	-2.8
Dairy feed & crop expense per cwt. milk	\$7.24	\$6.95	-4.0
Labor & machinery costs/cow	\$1,682	\$1,580	-6.1
Total farm operating costs per cwt. sold	\$17.31	\$16.16	-6.6
Interest costs per cwt. milk	\$0.51	\$0.36	-29.4
Milk marketing costs per cwt. milk sold	\$0.95	\$1.01	6.3
Operating cost of producing cwt. of milk	\$14.77	\$12.90	-12.7
Net milk income over purchased feed costs per cow	\$2,741	\$2,834	3.4
<u>Capital Efficiency (average for the year)</u>			
Farm capital per cow	\$11,737	\$11,403	-2.9
Machinery & equipment per cow	\$1,897	\$1,909	0.63
Asset turnover ratio	0.46	0.49	6.52
<u>Income Generation</u>			
Gross milk sales per cow	\$4,522	\$4,581	1.3
Gross milk sales per cwt.	\$17.04	\$17.32	1.6
Net milk sales per cwt.	\$16.09	\$16.31	1.4
Dairy cattle sales per cow	\$413	\$467	13.1
Dairy calf sales per cow	\$52	\$57	9.6
<u>Profitability</u>			
Net farm income without appreciation	\$194,347	\$890,242	358.1
Net farm income with appreciation	\$420,693	\$1,079,606	156.6
Labor & management income per operator/manager	\$-99,245	\$175,816	277.2
Rate of return on equity capital without appreciation	-0.0%	7.3%	73,100.0
Rate of return on all capital without appreciation	1.2%	6.2%	416.7
<u>Financial Summary (excluding deferred taxes)</u>			
Farm net worth, end of year	\$8,741,863	\$10,163,651	16.3
Debt to asset ratio	0.34	0.26	-23.5
Farm debt per cow	\$3,990	\$2,870	-28.1

<sup>3</sup>Average of large herd dairy farms that provided this data.

<sup>4</sup> Top 20% of large herd farms by rate of return on all assets without appreciation.

**RECEIPTS AND EXPENSES PER COW AND PER HUNDREDWEIGHT**  
Same 22 Top 20% Large Herd Dairy Farms, 2015 & 2016

Item	2015		2016	
	Per Cow	Per Cwt.	Per Cow	Per Cwt.
Average Number of Cows	1,101		1,175	
Cwt. of Milk Sold		278,665		310,901
<u>Accrual Operating Receipts</u>				
Milk	\$4,740	\$18.72	\$4,581	\$17.32
Dairy cattle	503	1.99	467	1.77
Dairy calves	121	0.48	57	0.22
Other livestock	5	0.02	34	0.13
Crops	85	0.34	135	0.51
Miscellaneous receipts	157	0.62	179	0.68
Total	\$5,610	\$22.16	\$5,453	\$20.61
<u>Accrual Operating Expenses</u>				
Hired labor	\$ 736	\$ 2.91	\$ 714	\$ 2.70
Dairy grain & concentrate	1,659	6.55	1,480	5.59
Dairy roughage	96	0.38	78	0.29
Nondairy feed	0	0.00	0	0.00
Professional nutritional services	0	0.00	2	0.01
Machine hire, rent & lease	144	0.57	154	0.58
Machine repair & vehicle expense	247	0.97	202	0.76
Fuel, oil & grease	153	0.61	109	0.41
Replacement livestock	3	0.01	17	0.06
Breeding	43	0.17	45	0.17
Veterinary & medicine	167	0.66	158	0.60
Milk marketing	253	1.00	267	1.01
Bedding	91	0.36	93	0.35
Milking supplies	76	0.30	72	0.27
Cattle lease	4	0.01	2	0.01
Custom boarding	108	0.43	98	0.37
bST expense	20	0.08	10	0.04
Livestock professional fees	14	0.06	15	0.06
Other livestock expense	29	0.11	18	0.07
Fertilizer & lime	168	0.66	108	0.41
Seeds & plants	112	0.44	108	0.41
Spray & other crop expense	58	0.23	61	0.23
Crop professional fees	4	0.01	4	0.02
Land, building & fence repair	87	0.34	58	0.22
Taxes	58	0.23	55	0.21
Real estate rent/lease	81	0.32	76	0.29
Insurance	51	0.20	46	0.17
Utilities	97	0.38	90	0.34
Interest paid	92	0.37	94	0.36
Other professional fees	19	0.08	19	0.07
Miscellaneous	22	0.09	19	0.07
Total Operating Expenses	\$4,694	\$18.54	\$4,274	\$16.16
Expansion livestock	33	0.13	9	0.03
Extraordinary Expense	7	0.03	0	0.00
Machinery depreciation	224	0.88	230	0.87
Real Estate depreciation	171	0.68	182	0.69
Total Expenses	\$5,129	\$20.26	\$4,695	\$17.75
Net Farm Income without appreciation	\$ 480	\$ 1.90	\$ 757	\$ 2.86

### **Supplementary Information**

Each year DFBS cooperators volunteer to complete supplementary data collection forms looking at selected management aspects of the business or specific research areas being studied. This is in addition to the normal DFBS data collection form. Two areas that were examined this year were the source of dairy replacements and the breakdown of the milk income and marketing expenses. Following is a summary of this information.

#### **SOURCE OF DAIRY REPLACEMENTS**

14 Dairy Farms, 2016

<u>Animals Entering Herd</u>	Average
Number calving in 2016 for first time	312
Animals purchased, % <sup>5</sup>	0.9
Animals raised by farm, % <sup>6</sup>	99.1
<u>Current Heifer Inventory</u>	
Raised on dairy, %	88.5
Raised by a custom grower, %	11.5

<sup>5</sup>Animals purchased are animals purchased from a different farm and were not the farm's genetics.

<sup>6</sup>Animals raised by farm are animals that were born on the farm and entered the herd, which includes animals raised by the farm or custom grower.

On the average farm, 312 animals calved for the first time in 2016. The breakdown on the source of these animals was 0.9 percent purchased and 99.1 percent raised on the farm. Of the current heifer inventory, 88.5 percent were raised on the dairy and 11.5 percent were raised by a custom grower. There is increased interest in evaluating the dairy replacement enterprise.

### **Milk Income and Marketing Expense Breakdown**

Starting January 1<sup>st</sup>, 2000, the northeast switched to multiple component pricing, which changed the format of the milk check and how farmers received payment for their milk. To examine the breakdown of the gross milk income and the marketing expenses, 109 farms filled out a detailed form for all the different sources of income for milk sales and the milk marketing expenses on an accrual basis. This information is reported in the following two tables. The tables are divided into six different areas, each representing a different area of income or expenses.

The first section looks at the value of the milk components on a per cwt. basis. The second area looks at the Producer Price Differential. The third area looks at the premiums a farm receives. Any premiums not specifically noted as quality or volume related are included in market premiums. The fourth area looks at the expenses associated with marketing milk. A line item in this section is the expense associated with utilizing forward contracting or hedging programs to market milk, such as commissions or broker fees. The fifth area is income from forward contracting or hedging programs. The sixth area is the patronage dividends or refunds from the milk cooperatives. Equity purchased in the milk cooperative utilizing a monthly deduction from the milk check or a percent of the patronage dividend is treated as a capital purchase and is not a milk marketing expense. The cumulative total for these six areas is the net price received on farms. For participating farms, the net farm price can be found on page 13 of the DFBS report.

The table on page 9 reports the averages for these different areas. The table on page 10 contains the range for each of the individual lines of the report. This table is in farm business chart format with each item sorted independently and ranked by fifths. Numbers for the different areas will not add to the totals for that quintile or to the net price received because the highest farms for each item were averaged, not the same farms throughout the six areas. This table shows the range of income and expenses received by farms for all the different areas.

For your individual farm, compare your accrual numbers following this same format to look at how you compare to other farms in your region and to identify possible areas to generate additional revenue.

**AVERAGE<sup>7</sup> MILK INCOME AND MARKETING REPORT**  
109 Large Herd Dairy Farms, 2016

	Pounds	Percent	Price/Pound	Total	\$/Cwt of Milk
<b>BASE FARM PRICE</b>					
Butterfat	1,113,337	3.80%	\$2.31	\$2,571,420	\$ 8.79
Protein	907,835	3.10%	\$2.10	\$1,905,731	\$ 6.51
Solids	1,686,370	5.76%	\$0.09	\$154,048	\$ 0.53
<b>Total Component Contribution</b>					<b>\$ 15.82</b>
<b>PPD</b>	29,266,567			\$58,643	<b>\$ 0.20</b>
<b>Base Farm Price</b>					<b>\$ 16.02</b>
<b>Premiums</b>					
Quality				\$79,706	\$ 0.27
Volume				\$72,695	\$ 0.25
Market Premiums				\$69,646	\$ 0.24
<b>Total Premiums</b>					<b>\$ 0.76</b>
<b>BASE FARM PRICE + PREMIUM</b>					<b>\$ 16.78</b>
<hr style="border-top: 1px dashed black;"/>					
<b>Deductions</b>					
Promo				\$43,236	\$ 0.15
Hauling & Coop Dues				\$237,455	\$ 0.81
<b>Total Deductions</b>				\$280,691	<b>\$ 0.96</b>
<b>BASE FARM PRICE + PREMIUMS – DEDUCTIONS</b>					<b>\$ 15.82</b>
<b>Marketing Programs</b>					
Futures Contracts, Forward Contracting, Etc.				\$13,589	\$ 0.05
<b>Total Marketing Income</b>					<b>\$ 0.05</b>
<b>Patronage Dividends</b>				\$63,486	<b>\$ 0.22</b>
<b>NET PRICE RECEIVED ON FARM, ALL SOURCES</b>					<b>\$ 16.09</b>
<b>Net Marketing Value (PPD + Total Premiums – Total Deductions), \$ per cwt.</b>					<b>\$ 0.00</b>

<sup>7</sup>Each calculation of an average is independent of all others. Therefore, math operations on the detail will not result in the totals. However, detail in the “\$/Cwt of Milk” column will result in the totals.



## SUMMARY AND ANALYSIS OF THE FARM BUSINESS

### Business Characteristics

Planning the optimal management strategies is a crucial component of operating a successful farm. Various combinations of farm resources, enterprises, business arrangements, and management techniques are used by the dairy farmers in this region. The following table shows important farm business characteristics and the number of farms with each characteristic.

#### BUSINESS CHARACTERISTICS

113 large Herd Dairy Farms, 2016

Type of Farm	Number	Type of Barn	Number
Dairy	113	Stanchion/Tie-Stall	0
Dairy – cash crop	0	Freestall	109
		Combination	4
Type of Ownership	Number	Milking System	Number
Owner	113	Pipeline	0
Renter	0	Herringbone Conventional	28
		Herringbone Rapid Exit	11
Type of Business	Number	Parallel	56
Single proprietorship	6	Parabone	3
Partnership	14	Rotary	4
Limited Liability Corporation	79	Other	10
Subchapter S Corporation	13		
Subchapter C Corporation	1	Milking Frequency	Number
		2x/day	13
		3x/day	92
		Other	8
		Production Records	Number
		Testing Service	85
		On-Farm System	22
		Other	0
		None	4
		Breed	Percent
		Holstein	95
		Jersey	2
		Other	3
Business Record System	Number		
Account Book	0		
Accounting Service	7		
On-Farm Computer	104		
Other	0		
BST Usage (reporting this is optional)	Number		
Used consistently	1		
Used inconsistently	0		
Started Use in 2016	0		
Stopped Use in 2016	0		
Not Used	0		
Average % bst usage of those reporting	98%		

### Income Statement

In order for an income statement to accurately measure farm income, it must include cash transactions and accrual adjustments (changes in accounts payable, accounts receivable, inventories, and prepaid expenses).

Cash paid is the actual cash outlay during the year and does not necessarily represent the cost of goods and services actually used in 2016.

Change in inventory: Increases in inventories of supplies and other purchased inputs are subtracted in computing accrual expenses because they represent purchased inputs not actually used during the year. Decreases in purchased inventories are added to expenses because they represent inputs purchased in a prior year and used this year.

**CASH AND ACCRUAL FARM EXPENSES**  
113 large Herd Dairy Farms, 2016

Expense Item	Cash Paid	-	Change in Inventory or Prepaid Expense	+	Change in Accounts Payable	=	Accrual Expenses
<u>Hired Labor</u>	\$863,710		\$-1,111		\$-1,588		\$863,233
<u>Feed</u>							
Dairy grain & concentrate	1,610,913		-66,029		19,638		1,696,580
Dairy roughage	96,008		-3,178		1,155		100,341
Nondairy	506		0		0		506
Professional nutritional services	1,647		8		44		1,683
<u>Machinery</u>							
Machinery hire, rent/lease	141,198		-359		4,592		146,149
Mach. repair & farm vehicle exp.	262,737		1,030		1,919		263,626
Fuel, oil & grease	123,769		-173		958		124,899
<u>Livestock</u>							
Replacement livestock	10,777		0		326		11,103
Breeding	61,564		-654		797		63,014
Vet & medicine	187,923		-854		1,614		190,391
Milk marketing	283,901		0		-2,409		281,492
Bedding	109,408		527		626		109,507
Milk supplies	101,289		-172		1,042		102,503
Cattle lease/rent	3,773		0		-47		3,726
Custom boarding	133,432		-95		739		134,267
bST expense	36,366		-743		404		37,513
Livestock professional fees	16,483		-166		283		16,932
Other livestock expense	18,131		0		394		18,524
<u>Crops</u>							
Fertilizer & lime	120,245		-6,104		-2,661		123,688
Seeds & plants	127,989		-4,733		2,138		134,860
Spray, other crop exp.	66,854		-2,362		465		69,681
Crop professional fees	9,401		-15		35		9,451
<u>Real Estate</u>							
Land/bldg./fence repair	79,747		-455		881		81,084
Taxes	70,012		-87		-12		70,088
Rent & lease	85,484		-301		92		85,877
<u>Other</u>							
Insurance	52,803		-848		160		53,811
Utilities (farm share)	97,561		0		107		97,668
Interest paid	150,271		-17		1,175		151,462
Other professional fees	30,133		158		183		30,158
Miscellaneous	<u>31,223</u>		<u>278</u>		<u>-173</u>		<u>30,771</u>
Total Operating Expenses	\$4,985,260		\$-86,453		\$32,875		\$5,104,588
Expansion livestock	38,994		0		24		39,018
Extraordinary expense	54		0		0		54
Machinery depreciation							271,207
Building depreciation							204,477
Total Accrual Expenses							\$5,619,343

Change in prepaid expenses (noted above by <<) is a net change in non-inventory expenses that have been paid in advance of their use. If 2016 funds used to prepay 2017 leases exceed the amount of 2016 leases prepaid in 2015, the amount of this excess is subtracted to exclude it from 2016 accrual lease expenses. The excess prepaid lease is charged against the future year's business operation. A decrease in prepaid lease is added to accrual expenses because it represents use of resources during this year that were paid for in past years.

Change in accounts payable: An increase in accounts payable from beginning to end of year is added when calculating accrual expenses because these expenses were incurred (resources used) in 2016 but not paid for. A decrease is subtracted because the resource was used before 2016.

Accrual expenses are the costs of inputs actually used in this year's production. They are the total of cash paid, as well as changes in inventory, prepaid expenses, and accounts payable.

### CASH AND ACCRUAL FARM RECEIPTS

113 large Herd Dairy Farms, 2016

Receipt Item	Cash Receipts	+	Change in Inventory	+	Change in Accounts Receivable	=	Accrual Receipts
Milk sales	\$5,075,752				\$-51,973		\$5,023,779
Dairy cattle	317,352		145,824		-3,797		459,378
Dairy calves	49,171		8,891		-18		58,044
Other livestock	22,504		-9,306		227		13,425
Crops	54,725		26,553		-613		80,665
Government receipts	52,582		2 <sup>9</sup>		-1,125		51,459
Custom machine work	17,987				-352		17,635
Gas tax refund	728				0		728
Other	<u>106,591</u>				<u>1,988</u>		108,579
Less nonfarm noncash cap.			<u>0<sup>10</sup></u>				<u>0</u>
Total Receipts	\$5,697,391		\$171,963		\$-55,663		\$5,813,691

<sup>9</sup> Change in advanced government receipts.

<sup>10</sup> Gifts or inheritances of cattle or crops included in inventory

Cash receipts include the gross value of milk checks received during the year plus all other payments received from the sale of farm products, services, and government programs. Nonfarm income is not included in calculating farm profitability.

Changes in inventory of assets produced by the business are calculated by subtracting beginning of year values from end of year excluding appreciation. Increases in livestock inventory caused by herd growth and/or quality are added, and decreases caused by herd reduction and/or quality are subtracted. Changes in inventories of crops grown are also included. An annual increase in advanced government receipts is subtracted from cash income because it represents income received in 2016 for the 2017 crop year in excess of funds earned for 2016. Likewise, a decrease is added to cash government receipts because it represents funds earned for 2016 but received in 2015.

Changes in accounts receivable are calculated by subtracting beginning year balances from end year balances. The January milk check for this December's marketings compared with the previous January's check is included as a change in accounts receivable.

Accrual receipts represent the value of all farm commodities produced and services actually generated by the farm business during the year.

### Profitability Analysis

Farm operators<sup>11</sup> contribute labor, management, and equity capital to their businesses and the combination of these resources, and the other resources used in the business, determines profitability. Farm profitability can be measured as the return to all family resources or as the return to one or more individual resources such as labor and management.

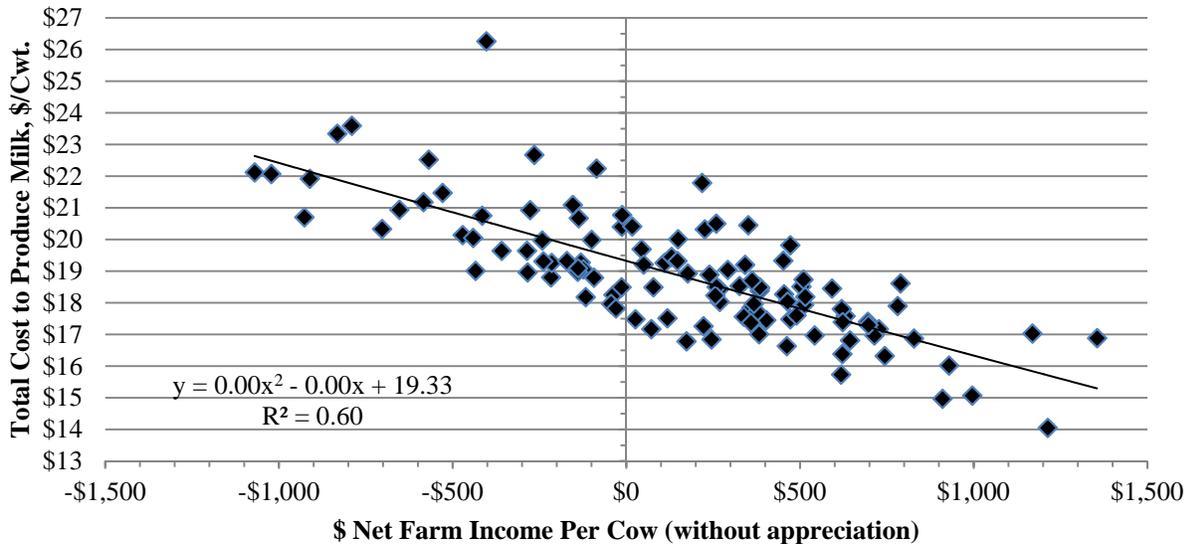
Net farm income is the return to the farm operators and other unpaid family members for their labor, management, and equity capital. It is the farm family's net annual return from working, managing, financing, and owning the farm business. This is not a measure of cash available from the year's business operation. Cash flow is evaluated later in this report.

Net farm income is computed both with and without appreciation. Appreciation represents the change in values caused by annual changes in prices of livestock, machinery, real estate inventory, and stocks and certificates (other than Farm Credit). Appreciation is a major factor contributing to changes in farm net worth and must be included for a complete profitability analysis.

### NET FARM INCOME 113 large Herd Dairy Farms, 2016

Item	Average 113 Farms		Average Top 20% <sup>12</sup> Farms	
	Total	Per Cow	Total	Per Cow
Total accrual receipts	\$ 5,813,691		\$ 6,408,739	
Appreciation: Livestock	6,688		10,834	
Machinery	23,217		11,462	
Real Estate	185,929		160,790	
Other Stock/Certificates	10,511		6,278	
Total Including Appreciation	\$ 6,040,036		\$ 6,598,104	
Total accrual expenses	<u>5,619,343</u>		<u>5,518,497</u>	
Net Farm Income (with appreciation)	\$ 420,693	\$379	\$ 1,079,606	\$919
Net Farm Income (without appreciation)	\$ 194,347	\$175	\$ 890,242	\$757

### TOTAL COST TO PRODUCE MILK VS. NET FARM INCOME PER COW 113 Large Herd Dairy Farms, 2016



<sup>11</sup>Operators are the individuals who are integrally involved in the operation and management of the farm business. They are not limited to those who own the farm or are formal members of the partnership or corporation.

<sup>12</sup>Top 20% of large herd farms by rate of return on all assets without appreciation.

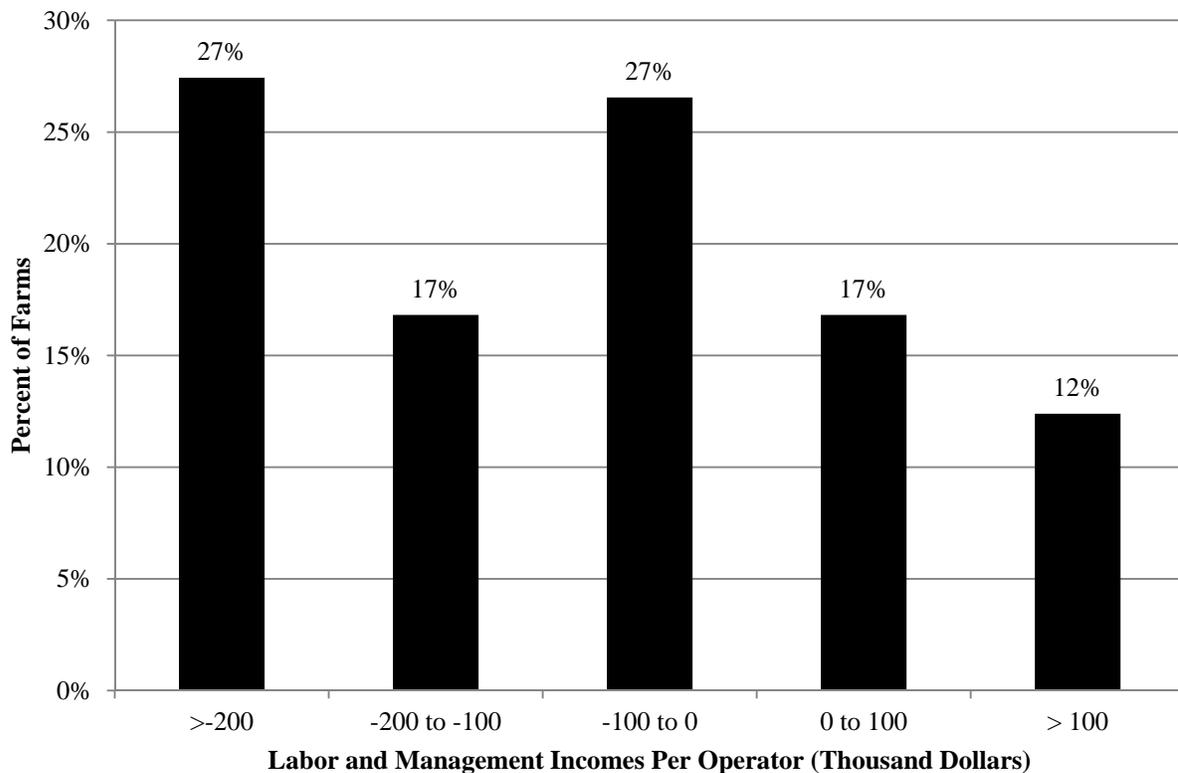
Labor and management income is the return which farm operators receive for their labor and management used in operating the farm business. Appreciation is not included as part of the return to labor and management because it results from ownership of assets rather than management of the farm business. Labor and management income is calculated by deducting a charge for unpaid family labor and the opportunity cost of using equity capital, at a real interest rate of five percent, from net farm income excluding appreciation. The interest charge of five percent reflects the long-term average rate of return above inflation that a farmer might expect to earn in comparable risk investments.

**LABOR AND MANAGEMENT INCOME**  
113 large Herd Dairy Farms, 2016

Item	Average 113 Farms	Average Top 20% Farms
Net farm income without appreciation	\$ 194,347	\$ 890,242
Family labor unpaid @ \$2,660 per month	- 485	- 121
Interest on \$8,736,250 (\$9,834,927 for top 20%) average equity capital @ 5% real rate	<u>- 437,013</u>	<u>- 492,776</u>
Labor & Management Income per Farm (2.45 operators/farm; 2.26 operators for top 20%)	\$ -243,150	\$ 397,345
Labor & Management Income per Operator/Manager	\$ -99,245	\$ 175,816

Labor and management income per operator averaged \$-99,245 on these 113 Farms in 2016. Returns to labor and management were less than \$-100,000 on 44 percent of the farms, with 27% of the farms showing a return to labor & management less than \$-200,000. Labor and management income per operator ranged from \$-100,000 to \$0 on 27 percent of the farms while 29 percent showed labor and management incomes per operator greater than \$0, with only 12% of the farms showing a return to labor & management greater \$100,000 this year.

**DISTRIBUTION OF LABOR & MANAGEMENT INCOMES PER OPERATOR**  
113 Large Herd Dairy Farms, 2016



Return on equity capital measures the net return remaining for the farmer's equity or owned capital after a charge has been made for the owner-operator's labor and management. The earnings or amount of net farm income allocated to labor and management is the opportunity cost of operators' labor and management estimated by the cooperators. Return on equity capital is calculated with and without appreciation. The rate of return on equity capital is determined by dividing the amount returned by the average farm net worth or equity capital. Return on total capital is calculated by adding interest paid to the return on equity capital and then dividing by average farm assets to calculate the rate of return on total capital.

### RETURN ON EQUITY CAPITAL AND RETURN ON TOTAL CAPITAL

113 large Herd Dairy Farms, 2016

Item	Average 113 Farms	Average Top 20% Farms
Net farm income with appreciation	\$ 420,693	\$ 1,079,606
Family labor unpaid @ \$2,660 per month	- 485	- 121
Value of operators' labor & management	<u>- 194,937</u>	<u>- 175,919</u>
Return on equity capital with appreciation	\$ 225,270	\$ 903,566
Interest paid	<u>+ 151,462</u>	<u>+ 110,551</u>
Return on total capital with appreciation	\$ 376,732	\$ 1,014,118
Return on equity capital without appreciation	\$ -1,075	\$ 714,202
Return on total capital without appreciation	\$ 150,387	\$ 824,753
Rate of return on average equity capital:		
with appreciation	2.6%	9.2%
without appreciation	-0.0%	7.3%
Rate of return on average total capital:		
with appreciation	2.9%	7.6%
without appreciation	1.2%	6.2%
Net farm income from operations ratio	0.03	0.14

#### **Farm and Family Financial Status**

The first step in evaluating the financial position of the farm is to construct a balance sheet which identifies all the assets and liabilities of the business. The second step is to evaluate the relationship between assets, liabilities, and net worth and changes that occurred during the year.

Financial lease obligations are included in the balance sheet. The present value of all future payments is listed as a liability since the farmer is committed to make the payments by signing the lease. The present value is also listed as an asset, representing the future value the item has to the business. For 2016, leases were discounted by 7 percent.

Advanced government receipts are included as current liabilities. Government payments received in 2016 that are for participation in the 2017 program are the end year balance and payments received in 2015 for participation in the 2016 program are the beginning year balance.

Current Portion or principal due in the next year for intermediate and long term debt is included as a current liability.

**2016 FARM BUSINESS & NONFARM MARKET VALUE BALANCE SHEET**

113 large Herd Dairy Farms, 2016

Farm Assets	Jan. 1	Dec. 31	Farm Liabilities & Net Worth	Jan. 1	Dec. 31
<u>Current</u>			<u>Current</u>		
Farm cash, checking & savings	\$ 83,932	\$ 75,772	Accounts payable	\$ 114,267	\$147,166
Accounts receivable	559,573	503,910	Operating debt	341,852	345,558
Prepaid expenses	13,350	10,517	Short Term	7,918	23,774
Feed & supplies	1,468,736	1,411,669	Advanced govt. receipts	2	0
			Current Portion:		
			Intermediate	306,887	315,265
			Long Term	<u>139,946</u>	<u>144,678</u>
Total Current	\$ 2,125,590	\$ 2,001,868	Total Current	\$ 910,872	\$ 974,441
<u>Intermediate</u>			<u>Intermediate</u>		
Dairy cows:			Structured debt		
owned	\$ 1,570,400	\$ 1,665,498	1-10 years	\$1,528,013	\$1,755,810
leased	126	65	Financial lease		
Heifers	910,080	977,338	(cattle/machinery)	13,443	11,152
Bulls/other livestock	32,183	21,923	Farm Credit stock	<u>1,420</u>	<u>1,420</u>
Mach./equipment owned	2,096,668	2,093,913	Total Intermediate	\$1,542,876	\$1,776,112
Mach./equipment leased	13,317	11,087			
Farm Credit stock	1,420	1,420			
Other stock/certificate	<u>450,984</u>	<u>496,427</u>			
Total Intermediate	\$ 5,075,177	\$ 5,267,671			
<u>Long Term</u>			<u>Long Term</u>		
Land/buildings:			Structured debt		
owned	\$ 5,591,992	\$ 5,993,260	>10 years	\$ 1,608,374	\$1,761,112
leased	<u>8,725</u>	<u>15,725</u>	Financial lease		
Total Long Term	\$ 5,600,718	\$ 6,008,985	(structures)	<u>8,803</u>	<u>15,725</u>
			Total Long Term	\$1,617,100	\$1,791,838
Total Farm Assets	\$12,801,485	\$13,278,523	Total Farm Liabilities	\$4,070,848	\$4,536,660
			FARM NET WORTH	\$8,730,637	\$8,741,863

## Nonfarm Assets, Liabilities &amp; Net Worth (Average of 30 farms reporting)

Assets	Jan. 1	Dec. 31	Liabilities & Net Worth	Jan. 1	Dec. 31
Personal cash, checking & savings	\$ 7,414	\$ 7,132	Nonfarm Liabilities	\$0	\$0
Cash value life insurance	119,751	130,690			
Nonfarm real estate	136,333	136,333			
Auto (personal share)	6,867	5,367			
Stocks & bonds	431,169	450,012			
Household furnishings	2,400	2,567			
All other nonfarm assets	<u>234,129</u>	<u>236,970</u>			
Total Nonfarm Assets	\$938,062	\$969,070	NONFARM NET WORTH	\$938,062	\$969,070

Farm & Nonfarm Assets, Liabilities, and Net Worth<sup>13</sup>

	Jan. 1	Dec. 31
Total Assets	\$13,739,547	\$14,247,593
Total Liabilities	<u>4,070,848</u>	<u>4,536,660</u>
TOTAL FARM & NONFARM NET WORTH	\$ 9,668,699	\$ 9,710,933

<sup>13</sup>Assumes that average nonfarm assets and liabilities for the non-reporting farms were the same as for those reporting.

Balance sheet analysis involves examination of relative asset and debt levels for the business. Percent equity is calculated by dividing end of year net worth by end of year assets and multiplying by 100. The debt to asset ratio is compiled by dividing liabilities by assets. Low debt to asset ratios reflect business solvency and the potential capacity to borrow. Debt levels per productive unit represent old standards that are still useful if used with measures of cash flow and repayment ability.

**BALANCE SHEET ANALYSIS**  
113 large Herd Dairy Farms, 2016

Item	Average 113 Farms	Average Top 20% Farms		
<u>Financial Ratios - Farm:</u>				
Percent equity	66%	74%		
Debt/asset ratio: total	0.34	0.26		
long-term	0.30	0.19		
intermediate/current	0.38	0.31		
Leverage Ratio	0.52	0.36		
Current Ratio	2.05	3.13		
Working Capital: \$1,025,427	as % of Total Expenses: 18%	\$1,834,468 33%		
<u>Farm Debt Analysis:</u>				
Accounts payable as % of total debt	3%	1%		
Long-term liabilities as a % of total debt	39%	30%		
Current & intermediate liabilities as a % of total debt	61%	70%		
Cost of term debt (weighted average)	4.04%	3.73%		
	<u>Average 113 Farms</u>	<u>Average Top 20% Farms</u>		
<u>Farm Debt Levels:</u>	<u>Per Cow</u>	<u>Per Tillable Acre Owned</u>	<u>Per Cow</u>	<u>Per Tillable Acre Owned</u>
Total farm debt	\$3,990	\$4,049	\$2,870	\$3,449
Long-term debt	1,576	1,599	857	1,030
Long-term & intermediate	3,131	3,178	2,188	2,630
Intermediate & current debt	2,414	2,450	2,013	2,419

Farm inventory balance is an accounting of the value of assets used on the balance sheet and the changes that occur from the beginning to end of year. Changes in the livestock inventory are included in the dairy analysis. Net investment indicates whether the capital stock is being expanded (positive) or depleted (negative).

**FARM INVENTORY BALANCE**  
113 large Herd Dairy Farms, 2016

Item	Average of 113 Farms	
	<u>Real Estate</u>	<u>Machinery &amp; Equipment</u>
Value beginning of year	\$ 5,591,992	\$ 2,096,668
Purchases	\$ 595,071 <sup>14</sup>	\$ 270,135
Gift/inheritance	+ 0	+ 0
Lost capital	- 168,648	
Sales	- 6,608	- 24,900
Depreciation	- 204,477	- 271,207
Net investment	= 215,338	= -25,972
Appreciation	+ 185,929	+ 23,217
Value end of year	\$ 5,993,260	\$ 2,093,913

<sup>14</sup> \$200,381 land and \$394,691 buildings and/or depreciable improvements.

**Statement of Owner Equity**

The Statement of Owner Equity has two purposes. It allows (1) verification that the accrual income statement and market value balance sheet are interrelated and consistent (in accountants terms, they reconcile) and (2) identification of the causes of change in equity that occurred on the farm during the year. The Statement of Owner Equity allows you to determine to what degree the change in equity was caused by (1) earnings from the business, and nonfarm income, in excess of withdrawals being retained in the business (called retained earnings), (2) outside capital being invested in the business or farm capital being removed from the business (called contributed/withdrawn capital) and (3) increases or decreases in the value (price) of assets owned by the business (called change in valuation equity).

Retained earnings is an excellent indicator of farm generated financial progress.

**STATEMENT OF OWNER EQUITY (RECONCILIATION)**

113 large Herd Dairy Farms, 2016

Item	Average 113 Farms	Average Top 20% Farms
Beginning of year farm net worth	\$ 8,730,637	\$9,506,203
Net farm income without appreciation	\$ 194,347	\$ 890,242
+ Nonfarm cash income	+ 3,458	+ 2,027
- Personal withdrawals & family expenditures excluding nonfarm borrowings	- \$ 301,816	- \$ 346,468
Retained Earnings	+\$ -104,011	+ \$ 545,800
Nonfarm noncash transfers to farm	\$ 0	\$ 0
+ Cash used in business from nonfarm capital	+ 58,642	+ 64,639
- Note/mortgage from farm real estate sold (nonfarm)	- 0	- 0
Contributed/Withdrawn Capital	= +\$ 58,642	+ \$ 64,639
Appreciation	\$ 226,345	\$ 189,365
- Lost capital	- 168,648	- 144,224
Change in Valuation Equity	+\$ 57,697	+ \$ 45,141
Imbalance/Error	- 1,103	- -1,867
End of year farm net worth <sup>15</sup>	= \$ 8,741,863	= \$10,163,651
Change in net worth with appreciation	\$ 11,226	\$ 657,447
<hr/>		
<u>Change in Net Worth</u>		
Without appreciation	\$ -215,119	\$468,083
With appreciation	\$ 11,226	\$657,447

<sup>15</sup>May not add due to rounding.

**Cash Flow Statement**

Completing an annual cash flow statement is an important step in understanding the sources and uses of funds for the business. Understanding last year's cash flow is the first step toward planning and managing cash flow for the current and future years.

The annual cash flow statement is structured to show net cash provided by operating activities, investing activities, financing activities and from reserves. All cash inflows and outflows, including beginning and end balances, are included. Therefore, the sum of net cash provided from all four activities should be zero. Any imbalance is the error from incorrect accounting of cash inflows/outflows.

**ANNUAL CASH FLOW STATEMENT**  
113 large Herd Dairy Farms, 2016

Item	Average 113 Farms	
<b><u>Cash Flow from Operating Activities</u></b>		
Cash farm receipts	\$ 5,697,391	
- Cash farm expenses	4,985,260	
- Extraordinary expense	54	
= Net cash farm income		\$ 712,077
Personal withdrawals/family expenses including nonfarm debt payments	\$ 301,797	
- Nonfarm income	<u>3,458</u>	
- Net cash withdrawals from the farm		<u>\$ 298,339</u>
= Net Provided by Operating Activities		\$ 413,739
<b><u>Cash Flow From Investing Activities</u></b>		
Sale of Assets: Machinery	\$ 24,900	
+ real estate	6,608	
+ other stock & certificates	<u>20,313</u>	
= Total asset sales		\$ 51,821
Capital purchases: expansion livestock	\$ 38,994	
+ machinery	270,135	
+ real estate	595,071	
+ other stock & certificates	<u>55,245</u>	
- Total invested in farm assets		<u>\$ 959,445</u>
= Net Provided by Investment Activities		\$ -907,624
<b><u>Cash Flow From Financing Activities</u></b>		
Money borrowed (intermediate & long term)	\$ 832,782	
+ Money borrowed (short-term)	25,690	
+ Increase in operating debt	3,705	
+ Cash from nonfarm capital used in business	58,642	
+ Money borrowed - nonfarm	<u>-19</u>	
= Cash inflow from financing		\$ 920,801
Principal payments (intermediate & long-term)	\$ 424,138	
+ Principal payments (short-term)	9,834	
+ Decrease in operating debt	<u>0</u>	
- Cash outflow for financing		<u>\$ 433,971</u>
= Net Provided by Financing Activities		\$ 486,829
<b><u>Cash Flow From Business</u></b>		
Beginning farm cash, checking & savings	\$ 83,932	
- Ending farm cash, checking & savings	<u>75,772</u>	
= Net Provided from Reserves		<u>\$ 8,159</u>
<b><u>Imbalance (error)</u></b>		<u>\$ 1,103</u>

**ANNUAL CASH FLOW STATEMENT**  
22 Top 20% Large Herd Dairy Farms, 2016

Item	Average Top 20% Farms	
<u>Cash Flow from Operating Activities</u>		
Cash farm receipts	\$6,021,483	
- Cash farm expenses	4,978,011	
- Extraordinary expense	<u>0</u>	
= Net cash farm income		\$ 1,043,472
Personal withdrawals/family expenses including nonfarm debt payments	\$ 346,468	
- Nonfarm income	<u>2,027</u>	
- Net cash withdrawals from the farm		<u>\$ 344,442</u>
= Net Provided by Operating Activities		\$ 699,030
<u>Cash Flow From Investing Activities</u>		
Sale of Assets: Machinery	\$ 27,636	
+ real estate	10,591	
+ other stock & certificate	<u>4,731</u>	
= Total asset sales		\$ 42,958
Capital purchases: expansion livestock	\$ 10,840	
+ machinery	260,105	
+ real estate	546,216	
+ other stock & certificate	<u>73,713</u>	
- Total invested in farm assets		<u>\$ 890,874</u>
= Net Provided by Investment Activities		\$ -847,916
<u>Cash Flow From Financing Activities</u>		
Money borrowed (intermediate & long term)	\$ 518,113	
+ Money borrowed (short-term)	27,226	
+ Increase in operating debt	63,018	
+ Cash from nonfarm capital used in business	64,639	
+ Money borrowed - nonfarm	<u>0</u>	
= Cash inflow from financing		\$ 672,997
Principal payments (intermediate & long-term)	\$ 510,343	
+ Principal payments (short-term)	13,235	
+ Decrease in operating debt	<u>0</u>	
- Cash outflow for financing		<u>\$ 523,578</u>
= Net Provided by Financing Activities		\$ 149,418
<u>Cash Flow From Business</u>		
Beginning farm cash, checking & savings		\$ 98,021
- Ending farm cash, checking & savings		<u>100,421</u>
= Net Provided from Reserves		\$ -2,399
<u>Imbalance (error)</u>		\$ -1,867

## Repayment Analysis

A valuable use of cash flow analysis is to compare the debt payments planned for the last year with the amount actually paid. The measures listed below provide a number of different perspectives on the repayment performance of the business. However, the critical question for many farmers and lenders is whether planned payments can be made in 2017. The cash flow projection worksheet on the next page can be used to estimate repayment ability, which can then be compared to planned 2017 debt payments shown below.

### FARM DEBT PAYMENTS PLANNED

Large Herd Dairy Farms, 2015 & 2016

Debt Payments	Same 111 Dairy Farms			Same 22 Top 20% Farms		
	2016 Payments		Planned 2017	2016 Payments		Planned 2017
	Planned	Made		Planned	Made	
Long-term	\$ 183,539	\$ 194,180	\$ 219,660	\$ 104,874	\$ 111,084	\$ 126,220
Intermediate-term	351,142	375,238	388,526	344,039	503,390	387,722
Short-term	1,897	10,375	9,279	1,963	13,788	11,182
Operating (net reduction)	22,216	74,611	5,501	0	69,090	7,300
Accounts payable (net reduction)	3,807	18,236	720	0	16,760	570
Total	\$ 562,601	\$ 672,641	\$ 623,687	\$ 450,875	\$ 714,111	\$ 532,994
Per cow	\$ 513	\$ 613		\$ 384	\$ 608	
Per cwt. 2016 milk	\$ 1.93	\$ 2.31		\$ 1.45	\$ 2.30	
Percent of total 2016 receipts	10.0%	11.7%		7.5%	11.1%	
Percent of 2016 milk receipts	11.2%	13.5%		8.4%	13.3%	

The cash flow coverage ratio and debt coverage ratio measure the ability of the farm business to meet its planned debt payments schedule. The ratios show the percentage of payments planned for 2016 (as of December 31, 2015) that could have been made with the amount available for debt service in 2016. Farmers who did not participate in DFBS in 2015 have their 2016 cash flow coverage ratio based on planned debt payments for 2017.

### COVERAGE RATIOS

Same 111 Large Herd Dairy Farms, 2015 & 2016

Item	Average	Item	Average
<u>Cash Flow Coverage Ratio</u>		<u>Debt Coverage Ratio</u>	
Cash farm receipts	\$ 5,633,741	Net farm income (without appreciation)	\$ 209,440
- Cash farm expenses	4,911,786	+ Depreciation	477,728
+ Interest paid (cash)	150,118	+ Interest paid (accrual)	150,836
- Net personal withdrawals from farm <sup>16</sup>	<u>301,459</u>	- Net personal withdrawals from farm <sup>16</sup>	<u>301,459</u>
(A) = Amount Available for Debt Service	\$ 570,615	(A') = Repayment Capacity	\$ 536,546
(B) = Debt Payments Planned for 2016 (as of December 31, 2015)	\$ 562,601	(B) = Debt Payments Planned for 2016 (as of December 31, 2015)	\$ 562,601
(A/B) = Cash Flow Coverage Ratio for 2016	1.01	(A'/B) = Debt Coverage Ratio for 2016	0.95
-----			
Same 22 Top 20% Dairy Farms, 2015 & 2016			
(A) = Amount Available for Debt Service	\$ 809,526	(A') = Repayment Capacity	\$ 1,140,660
(B) = Debt Payments Planned for 2016	\$ 450,875	(B) = Debt Payments Planned for 2016	\$ 450,875
(A/B) = Cash Flow Coverage Ratio for 2016	1.80	(A'/B) = Debt Coverage Ratio for 2016	2.53

<sup>16</sup>Personal withdrawals and family expenditures less nonfarm income and nonfarm money borrowed. If family withdrawals are excluded, or inaccurately included, the cash flow coverage ratio will be incorrect.

**ANNUAL CASH FLOW WORKSHEET**  
113 large Herd Dairy Farms, 2016

Item	Average 113 Farms		Total
	Per Cow	Per Cwt.	
Number cows and cwt. Milk	1,097	291,316	
<u>Accrual Operating Receipts</u>			
Milk	\$4,527	\$17.05	\$ 4,968,070
Dairy cattle	413	1.56	453,597
Dairy calves	53	0.20	57,869
Other livestock	12	0.04	12,782
Crops	73	0.28	80,381
Misc. receipts	<u>161</u>	<u>0.61</u>	<u>176,485</u>
Total Operating Receipts	\$5,239	\$19.74	\$ 5,749,184
<u>Accrual Operating Expenses</u>			
Hired labor	\$ 776	\$ 2.92	\$ 851,869
Dairy grain & concentrate	1,532	5.77	1,681,125
Dairy roughage	90	0.34	98,342
Nondairy feed	0	0.00	515
Professional nutritional services	2	0.01	1,714
Machinery hire/rent/lease	128	0.48	140,457
Machinery repair & farm vehicle expense	237	0.89	260,115
Fuel, oil & grease	113	0.43	123,829
Replacement livestock	10	0.04	11,303
Breeding	56	0.21	61,708
Veterinary & medicine	170	0.64	186,295
Milk marketing	255	0.96	279,455
Bedding	97	0.37	106,765
Milking supplies	91	0.34	99,970
Cattle lease	3	0.01	3,793
Custom boarding	105	0.39	114,750
bST expense	32	0.12	35,063
Livestock professional fees	15	0.06	16,696
Other livestock expense	17	0.06	18,858
Fertilizer & lime	113	0.42	123,801
Seeds & plants	122	0.46	133,343
Spray/other crop expenses	63	0.24	68,606
Crop professional fees	9	0.03	9,622
Land, building, fence repair	74	0.28	81,753
Taxes	64	0.24	69,760
Real estate rent/lease	76	0.29	83,824
Insurance	46	0.17	50,926
Utilities	88	0.33	97,089
Other professional fees	28	0.10	30,302
Miscellaneous	<u>27</u>	<u>0.10</u>	<u>29,794</u>
Total Less Interest Paid	\$4,439	\$16.72	\$ 4,871,437
<u>Net Accrual Operating Income</u>			
(without interest paid)	\$ 800	\$ 3.01	\$ 877,746
- Change in livestock/crop inventory <sup>17</sup>	158	0.59	172,908
- Change in accounts receivable	-52	-0.20	-57,466
- Change in feed/supply inventory <sup>18</sup>	-80	-0.30	-88,218
+ Change in accounts payable <sup>19</sup>	<u>20</u>	<u>0.07</u>	<u>21,568</u>
NET CASH FLOW	\$ 795	\$ 2.99	\$ 872,090
- Net personal withdrawals from farm (see footnote on page 22)	<u>275</u>	<u>1.03</u>	<u>301,459</u>
Available for Farm Debt Payments & Investments	\$ 520	\$ 1.96	\$ 570,632
- Farm debt payments	<u>613</u>	<u>2.31</u>	<u>672,641</u>
Available for Farm Investment	\$ -93	\$ -0.35	\$ -102,010
- Capital purchases: cattle, machinery & improvements	<u>883</u>	<u>3.33</u>	<u>968,756</u>
Additional Capital Needed	\$ -976	\$ -3.68	\$ -1,070,765

<sup>17</sup>Includes change in advance government receipts.

<sup>18</sup>Includes change in prepaid expenses.

<sup>19</sup>Excludes change in interest account payable.

**ANNUAL CASH FLOW WORKSHEET**  
22 Top 20% Large Herd Dairy Farms, 2016

Item	Average Top 20% Farms		
	Per Cow	Per Cwt.	Total
No. cows or cwt. milk	1,175	310,901	
<u>Accrual Operating Receipts</u>			
Milk	\$4,581	\$17.32	\$5,384,195
Dairy cattle	467	1.77	548,986
Dairy calves	57	0.22	66,914
Other livestock	34	0.13	39,559
Crops	135	0.51	158,866
Misc. receipts	<u>179</u>	<u>0.68</u>	<u>210,219</u>
Total Operating Receipts	\$5,453	\$20.61	\$6,408,739
<u>Accrual Operating Expenses</u>			
Hired labor	\$ 714	\$ 2.70	\$ 839,158
Dairy grain & concentrate	1,480	5.59	1,739,320
Dairy roughage	78	0.29	91,420
Nondairy feed	0	0.00	0
Professional nutritional services	2	0.01	1,777
Mach. hire/rent/lease	154	0.58	181,392
Mach. repair & farm vehicle expense	202	0.76	237,736
Fuel, oil & grease	109	0.41	128,543
Replacement livestock	17	0.06	19,842
Breeding	45	0.17	52,777
Veterinary & medicine	158	0.60	185,837
Milk marketing	267	1.01	314,258
Bedding	93	0.35	108,843
Milking supplies	72	0.27	84,830
Cattle lease	2	0.01	2,773
Custom boarding	98	0.37	115,324
bST expense	10	0.04	11,946
Livestock professional fees	15	0.06	17,194
Other livestock expense	18	0.07	21,544
Fertilizer & lime	108	0.41	127,079
Seeds & plants	108	0.41	126,917
Spray/other crop expenses	61	0.23	71,558
Crop professional fees	4	0.02	4,770
Land, building, fence repair	58	0.22	67,681
Taxes	55	0.21	64,775
Real estate rent/lease	76	0.29	89,702
Insurance	46	0.17	54,275
Utilities	90	0.34	105,942
Other professional fees	19	0.07	22,737
Miscellaneous	<u>19</u>	<u>0.07</u>	<u>22,849</u>
Total Less Interest Paid	\$4,180	\$15.80	\$4,912,797
<u>Net Accrual Operating Income</u>			
(without interest paid)	\$1,273	\$ 4.81	\$1,495,942
- Change in livestock/crop inventory <sup>20</sup>	316	1.19	371,363
- Change in accounts receivable	14	0.05	15,894
- Change in feed/supply inventory <sup>21</sup>	-41	-0.15	-48,084
+ Change in accounts payable <sup>22</sup>	<u>-2</u>	<u>-0.01</u>	<u>-2,717</u>
NET CASH FLOW	\$ 982	\$ 3.71	\$1,154,053
- Net personal withdrawals from farm(see footnote page 22)	<u>293</u>	<u>1.11</u>	<u>344,442</u>
Available for Farm Debt Payments & Investments	\$ 689	\$ 2.60	\$ 809,611
- Farm debt payments	<u>608</u>	<u>2.30</u>	<u>714,111</u>
Available for Farm Investment	\$ 81	\$ 0.31	\$ 95,500
- Capital purchases: cattle, machinery & improvements	<u>758</u>	<u>2.87</u>	<u>890,874</u>
Additional Capital Needed	\$ -677	\$ -2.56	\$ -795,374

<sup>20</sup>Includes change in advance government receipts.

<sup>21</sup>Includes change in prepaid expenses.

<sup>22</sup>Excludes change in interest account payable.

**Cropping Analysis**

The cropping program is an important part of the dairy farm business and often represents opportunities for improved productivity and profitability. A complete evaluation of what the available land resources are, how they are being used, how well crops are producing, and what it costs to produce them is important to evaluating alternative cropping and feed purchasing alternatives.

**LAND RESOURCES AND CROP PRODUCTION**

113 large Herd Dairy Farms, 2016

Item	Average 113 Farms			Average Top 20% Farms		
	<u>Owned</u>	<u>Rented</u>	<u>Total</u>	<u>Owned</u>	<u>Rented</u>	<u>Total</u>
<u>Land</u>						
Tillable	1,120	1,031	2,151	1,051	1,125	2,176
Nontillable	32	7	39	57	0	57
Other nontillable	<u>208</u>	<u>6</u>	<u>214</u>	<u>147</u>	<u>0</u>	<u>147</u>
Total	1,360	1,044	2,404	1,255	1,125	2,380
<u>Crop Yields</u>	<u>Farms</u>	<u>Acres</u> <sup>23</sup>	<u>Prod/Acre</u>	<u>Farms</u>	<u>Acres</u>	<u>Prod/Acre</u>
Hay crop	111	916	3.21 tn DM	21	973	3.43 tn DM
Corn silage	110	960	17.16 tn	21	997	18.21 tn
Other forage	33	234	3.01 tn DM	7	184	3.33 tn DM
Total forage	111	1,937	4.57 tn DM	21	2,031	4.87 tn DM
Corn grain	56	316	140 bu	12	407	135 bu
Oats	1	80	55 bu	0	0	0 bu
Wheat	29	173	77 bu	3	162	73 bu
Other crops	35	179		8	78	
Tillable pasture	4	342		0	0	
Idle tillable	19	138		1	12	
Total Tillable Acres	113	2,151		22	2,176	

<sup>23</sup>This column represents the average acreage for the farms producing that crop. Average acreages including those farms not producing were corn grain 157, oats 1, wheat 44, tillable pasture 12, and idle 23.

Average crop acres and yields compiled for the region are for the farms reporting each crop. Yields of forage crops have been converted to tons of dry matter using dry matter coefficients reported by the farmers. Grain production has been converted to bushels of dry grain equivalent based on dry matter information provided.

The following crop/dairy ratios indicate the relationship between forage production, forage production resources, and the dairy herd.

**CROP/DAIRY RATIOS**111 Large Herd Dairy Farms, 2016 <sup>24</sup>

Item	Average 111 Farms	Average Top 20% Farms
Total tillable acres per cow	1.96	1.91
Total forage acres per cow	1.74	1.70
Harvested forage dry matter, tons per cow	7.95	8.30

<sup>24</sup> Excludes farms that do not harvest forages.

**Cropping Analysis** (continued)

A number of cooperators have allocated crop expenses among the hay crop, corn, and other crops produced. Fertilizer and lime, seeds and plants, and spray and other crop expenses have been computed per acre and per production unit for hay and corn. Additional expense items such as fuels, labor, and machinery repairs are not included. Rotational grazing was used on three farms.

**CROP RELATED ACCRUAL EXPENSES**

Large Herd Dairy Farms Reporting, 2016

Item	Total Per Till. Acre	All Corn Per Acre	Corn Silage Per Ton DM	Corn Grain Per Dry Sh. Bu.	Hay Crop	
					Per Acre	Per Ton DM
No. of farms reporting	111 <sup>25</sup>	5			5	
Ave. number of acres	2,189	823			770	
Fertilizer/lime	\$ 60.53	\$ 60.01	\$ 10.31	\$ 0.28	\$ 42.07	\$ 13.39
Seed/plants	62.29	103.67	18.00	0.36	42.80	13.88
Spray/other crop exp.	<u>32.77</u>	<u>49.69</u>	<u>8.53</u>	<u>0.14</u>	<u>12.05</u>	<u>4.94</u>
TOTAL	\$ 155.59	\$ 213.37	\$ 36.84	\$ 0.78	\$ 96.92	\$ 32.20
<u>Average Top 20% Farms:</u>						
No. of farms reporting	21 <sup>24</sup>					
Ave. number of acres	2,275					
Fertilizer/lime	\$ 57.48					
Seeds/plants	59.31					
Spray/other crop exp.	<u>30.73</u>					
TOTAL	\$ 147.52					

<sup>25</sup> Excludes farms that do not harvest forages.

Most machinery costs are associated with crop production and should be analyzed with the crop enterprise. Total machinery expenses include the major fixed costs (interest and depreciation), as well as the accrual operating costs. Although machinery costs have not been allocated to individual crops, they are shown below per total tillable acre.

**ACCRUAL MACHINERY EXPENSES** <sup>26</sup>

111 Large Herd Dairy Farms, 2016

Machinery Expense Item	Average 111 Farms		Average Top 20% Farms	
	Total Expenses	Per Tillable Acre	Total Expenses	Per Tillable Acre
Fuel, oil & grease	\$126,417	\$ 57.75	\$133,436	\$ 58.65
Machinery repairs & farm vehicle exp.	266,534	121.76	246,789	108.48
Machine hire, rent & lease	147,124	67.21	181,329	79.71
Interest (5%)	106,718	48.75	116,866	51.37
Depreciation	<u>274,322</u>	<u>125.32</u>	<u>282,521</u>	<u>124.19</u>
Total	\$921,115	\$420.79	\$960,940	\$422.40

<sup>26</sup> Excludes farms that do not harvest forages.

**Dairy Analysis**

Analysis of the dairy enterprise can reveal a great deal about the strengths and weaknesses of the dairy farm business. Information on the following pages should be used in conjunction with DHI and other dairy production information. Changes in dairy herd size and market values that occur during the year are identified in the table below. The change in inventory value without appreciation is attributed to physical changes in herd size and quality. Any change in inventory is included as an accrual farm receipt when calculating all of the profitability measures on pages 14 through 16.

**Dairy Analysis** (continued)

**DAIRY HERD INVENTORY**  
113 large Herd Dairy Farms, 2016

Item	Dairy Cows		Bred		Heifers		Calves	
	No.	Value	No.	Value	No.	Value	No.	Value
<u>Average 113 Farms:</u>								
Beginning year (owned)	1,065	\$1,570,400	339	\$486,122	315	\$284,762	272	\$139,196
+ Change w/o appreciation		88,184		25,044		32,595		8,891
+ Appreciation		<u>6,914</u>		<u>4,059</u>		<u>-1,052</u>		<u>-2,279</u>
End year (owned)	1,124	\$1,665,498	355	\$515,225	353	\$316,305	287	\$145,808
End including leased	1,137							
Average number	1,111		969 (all age groups)					
<u>Average Top 20% Farms:</u>								
Beginning year (owned)	1,111	\$1,676,527	316	\$472,067	311	\$282,950	316	\$164,157
+ Change w/o appreciation		153,018		39,643		49,876		12,173
+ Appreciation		<u>11,727</u>		<u>-1,050</u>		<u>2,436</u>		<u>-1,789</u>
End of year (owned)	1,208	\$1,841,273	341	\$510,660	364	\$335,263	335	\$174,541
End including leased	1,263							
Average number	1,175		1,013 (all age groups)					

Total milk sold and milk sold per cow along with components produced are extremely valuable measures of size and productivity, respectively, on the dairy farm. These measures of milk output are based on pounds of milk marketed during the year. Farm managers on DHI should compare milk sold per cow with their rolling herd average on the test date nearest December 31 to see how close the DHI estimate of milk produced is to actual milk sales.

**MILK PRODUCTION**  
113 large Herd Dairy Farms, 2016

Item	Average 113 Farms	Average Top 20% Farms
Total milk sold, lbs.	29,482,356	31,090,110
Milk sold per cow, lbs.	26,536	26,454
Butterfat per cow, lbs.	1,011 <sup>27</sup>	1,013
Protein per cow, lbs.	825 <sup>27</sup>	827
Total butterfat and protein per cow, lbs.	1,836 <sup>27</sup>	1,839
Other solids per cow, lbs.	1,535 <sup>27</sup>	1,532
Total components per cow, lbs.	3,368 <sup>27</sup>	3,371

<sup>27</sup> This data is an average for the 109 farms that provided the data.

**ANIMALS LEAVING THE HERD**  
113 large Herd Dairy Farms, 2016

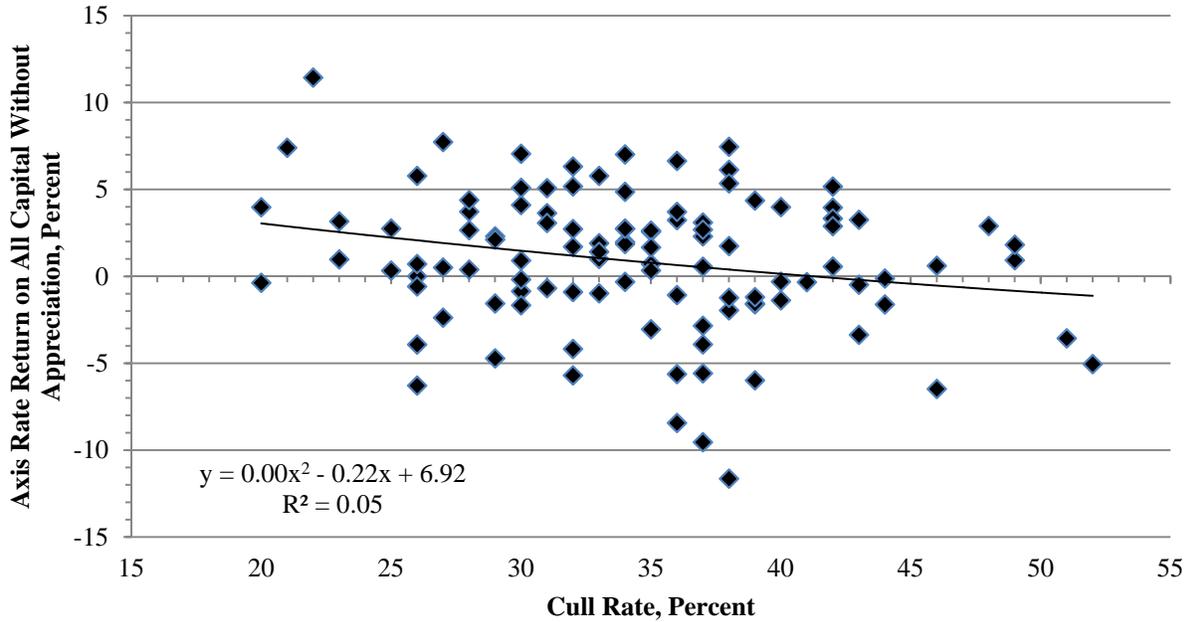
	Average 113 Farms		Average Top 20% Farms	
	Number	Percent <sup>28</sup>	Number	Percent <sup>28</sup>
Cows sold for beef	308	27.8	292	24.8
Cows sold for dairy	17	1.5	7	0.6
Cows died	64	5.7	75	6.3
Culling rate <sup>29</sup>	---	33.5	---	31.1

<sup>28</sup>Percent of average number of cows in the herd.

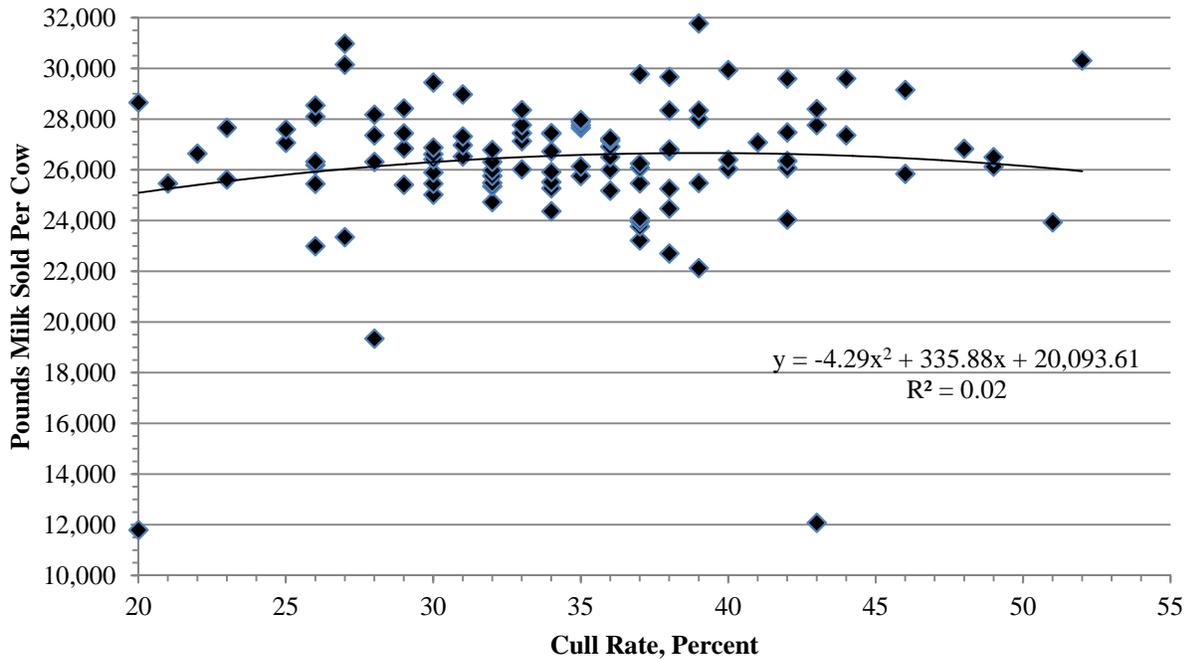
<sup>29</sup>Cows sold for beef plus cows died.

Cull rate measures the turnover of cows within the dairy herd and is comprised of both animals that die on the farm and animals that are sold as beef. Cull rates are impacted by the herd management skills of the farm owners and where the business is in terms of growth cycles and cow life cycles. The following two charts look at the relationship between percent cull rates, milk production and profit levels. There is a curvilinear relationship between cull rate and these two measures for 2016.

**RETURN TO ALL CAPITAL WITHOUT APPRECIATION VERSUS CULL RATE**  
**108 Large Herd Dairy Farms, 2016**



**MILK SOLD PER COW VERSUS CULL RATE**  
**108 Large Herd Dairy Farms, 2016**



The cost of producing milk has been compiled using the whole farm method and is featured in the following table. Accrual receipts from milk sales can be compared with the accrual costs of producing milk per cow and per hundredweight of milk. Using the whole farm method, operating costs of producing milk are estimated by deducting nonmilk accrual receipts from total accrual operating expenses including expansion livestock purchased. Purchased inputs cost of producing milk are the operating costs plus depreciation. Total costs of producing milk include the operating costs of producing milk plus depreciation on machinery and buildings, the value of unpaid family labor, the value of operators' labor and management, and the interest charge for using equity capital.

### ACCRUAL RECEIPTS FROM DAIRY AND COST OF PRODUCING MILK

113 large Herd Dairy Farms, 2016

Item	Average 113 Farms			Average Top 20% Farms		
	Total	Per Cow	Per Cwt.	Total	Per Cow	Per Cwt.
<u>Accrual Costs of Producing Milk</u>						
Operating costs	\$ 4,353,694	\$ 3,919	\$ 14.77	\$ 4,009,645	\$ 3,412	\$ 12.90
Purchased inputs costs	\$ 4,829,431	\$ 4,347	\$ 16.38	\$ 4,493,953	\$ 3,824	\$ 14.45
Total Costs	\$ 5,461,866	\$ 4,916	\$ 18.53	\$ 5,162,769	\$ 4,393	\$ 16.61
<u>Accrual Receipts From Milk</u>						
Net Milk Receipts	\$ 5,023,779	\$ 4,522	\$ 17.04	\$ 5,384,195	\$ 4,581	\$ 17.32
Net Farm Income	\$ 4,742,286	\$ 4,251	\$ 16.09	\$ 5,069,937	\$ 4,329	\$ 16.31
without appreciation	\$ 194,347	\$ 175	\$ 0.66	\$ 890,242	\$ 757	\$ 2.86
with appreciation	\$ 420,693	\$ 379	\$ 1.43	\$ 1,079,606	\$ 919	\$ 3.47

The accrual operating expenses most commonly associated with the dairy enterprise are listed in the table below. Evaluating these costs per unit of production enables an evaluation of the dairy enterprise.

### DAIRY RELATED ACCRUAL EXPENSES

113 large Herd Dairy Farms, 2016

Item	Average 113 Farms		Average Top 20% Farms	
	Per Cow	Per Cwt.	Per Cow	Per Cwt.
Purchased dairy grain & concentrate	\$ 1,526	\$ 5.75	\$ 1,480	\$ 5.59
Purchased dairy roughage	90	0.34	78	0.29
Total Purchased Dairy Feed	\$ 1,617	\$ 6.09	\$ 1,558	\$ 5.89
Purchased grain & concentrate as % of milk receipts		34%		33%
Purchased feed & crop expense	\$ 1,921	\$ 7.24	\$ 1,839	\$ 6.95
Purchased feed & crop expense as % of milk receipts		43%		41%
Breeding	\$ 57	\$ 0.21	\$ 45	\$ 0.17
Veterinary & medicine	171	0.65	158	0.60
Milk marketing	253	0.95	267	1.01
Bedding	99	0.37	93	0.35
Milking supplies	92	0.35	72	0.27
Cattle lease	3	0.01	2	0.01
Custom boarding	121	0.46	98	0.37
bST expense	34	0.13	10	0.04
Livestock professional fees	15	0.06	15	0.06
Other livestock expenses	17	0.06	18	0.07

**Cost of Producing Milk**

The cost of producing milk has been compiled below using the whole farm method. The following steps are used in the calculations.

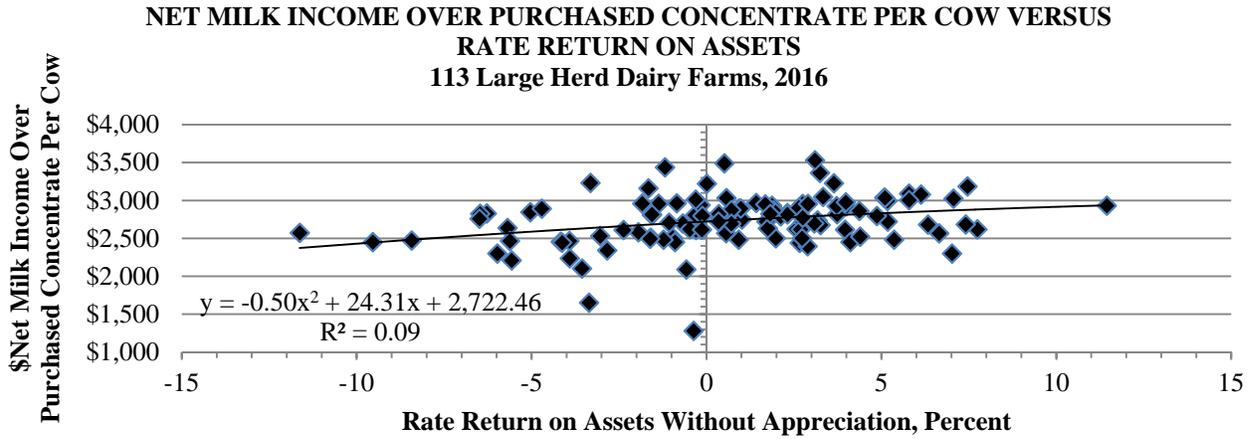
1. The cost of expansion livestock is added to total accrual operating expenses to offset any related inventory increase included in accrual receipts.
2. Accrual milk sales are deducted from total accrual receipts to get total accrual nonmilk receipts which are used to represent total nonmilk operating costs.
3. Total accrual nonmilk receipts are subtracted from total accrual operating expenses including expansion livestock to calculate the operating costs of producing milk.
4. Machinery depreciation and building depreciation are added to operating costs to determine the purchased inputs cost of producing milk.
5. The opportunity costs of equity capital, operator's labor and operator's management and the value of unpaid family labor are added to all other costs to obtain the total costs of producing milk. This cost includes all the operating, depreciation, and imputed costs of producing milk.

**COST OF PRODUCING MILK WHOLE FARM METHOD CALCULATIONS**

113 large Herd Dairy Farms, 2016

Item	Average 113 Farms		Average Top 20% Farms	
Total Accrual Operating Expenses	\$	5,104,588	\$	5,023,349
Expansion Livestock, Accrual	+	<u>39,018</u>	+	<u>10,840</u>
1. Total Accrual Operating Expenses, Including Expansion Livestock		\$ 5,143,606		\$ 5,034,189
Total Accrual Receipts	\$	5,813,691	\$	6,408,739
Milk Sales, Accrual	-	<u>5,023,779</u>	-	<u>5,384,195</u>
2. Total Accrual Nonmilk Receipts		- <u>789,912</u>		- <u>1,024,544</u>
3. Operating Costs of Producing Milk		\$ 4,353,694		\$ 4,009,645
Cwt. of Milk Sold	÷	294,824	÷	310,901
Operating Costs/Cwt.	=	\$14.77	=	\$12.90
Machinery Depreciation	+	271,207	+	270,598
Building Depreciation	+	204,477	+	213,711
Extraordinary Expenses	+	<u>54</u>	+	<u>0</u>
4. Purchased Inputs Cost of Producing Milk		\$ 4,829,432		\$ 4,493,953
Cwt. of Milk Sold	÷	294,824	÷	310,901
Purchased Inputs Cost/Cwt.	=	\$16.38	=	\$14.45
Family Labor Unpaid (\$2,660/month)	+	485	+	121
Real Interest on Equity Capital	+	437,013	+	492,776
Value of Operators' Labor & Management	+	<u>194,937</u>	+	<u>175,919</u>
5. Total Costs of Producing Milk		\$ 5,461,867		\$ 5,162,769
Cwt. Milk Sold	÷	294,824	÷	310,901
Total Costs/Cwt.	=	\$18.53	=	\$16.61

Net milk income over purchased feed cost per cow is a measure that incorporates the cost of purchased grain and concentrates along with the milk produced per cow and the price received for the component production. It is one of the key measures used to evaluate the effectiveness of the feeding program. Below is the relationship between net milk income over purchased feed cost per cow and return on assets without appreciation.

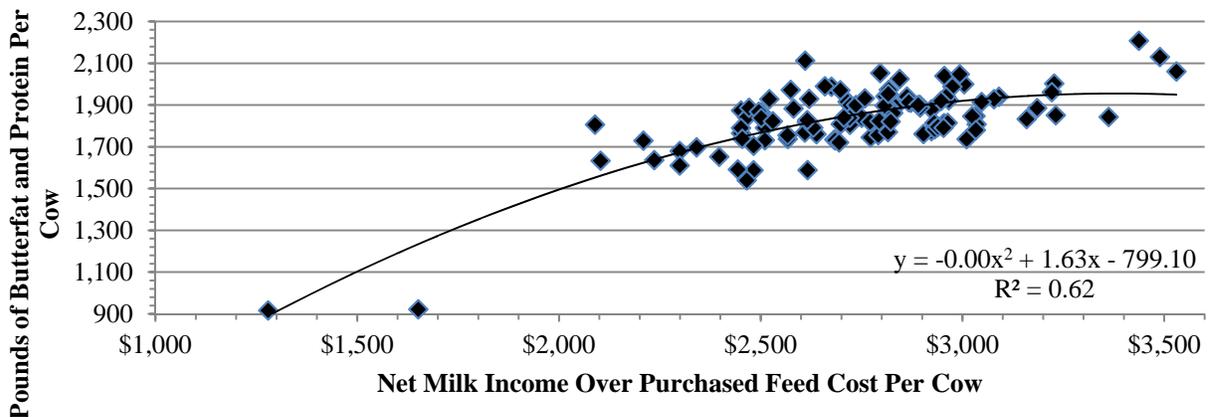


With the change to component milk pricing in 2000, component production has become a focus point for dairy managers. The table and chart below examine the relationship between net milk income over purchased grain and concentrates and cost, price, and milk composition characteristics. The table and charts on page 32 and 33 present costs of producing milk and profitability on the basis of butterfat and protein produced.

**COMPONENT PRODUCTION AND COSTS PER HUNDREDWEIGHT BY NET MILK  
INCOME OVER PURCHASED FEED COST PER COW  
109 Large Herd Dairy Farms, 2016**

Net Milk Income Over Purchased Feed Cost Per Cow	Milk Production Per Cow	Butterfat pounds Per Cow	Protein Pounds Per Cow	Purchased Feed Costs Per Cwt.	Operating Cost of Producing Milk	Net Milk Price Per Cwt.
\$ 3,293	28,363	1,096	875	\$ 5.43	\$ 14.21	\$ 16.70
3,018	27,349	1,044	848	5.69	13.64	16.39
2,943	26,945	1,015	836	6.02	14.24	16.45
2,865	27,168	1,053	839	6.08	15.53	16.20
2,801	27,400	1,031	843	5.85	13.99	15.98
2,720	27,107	1,026	835	6.43	14.86	16.07
2,641	26,268	1,003	811	5.90	14.39	15.86
2,553	26,861	1,018	831	6.36	14.98	15.64
2,470	25,455	977	792	6.42	16.20	15.91
2,122	21,787	846	688	6.69	16.78	16.15

**POUNDS BUTTERFAT AND PROTEIN PER COW VERSUS NET MILK INCOME  
OVER PURCHASED FEED COST PER COW  
109 Large Herd Dairy Farms, 2016**



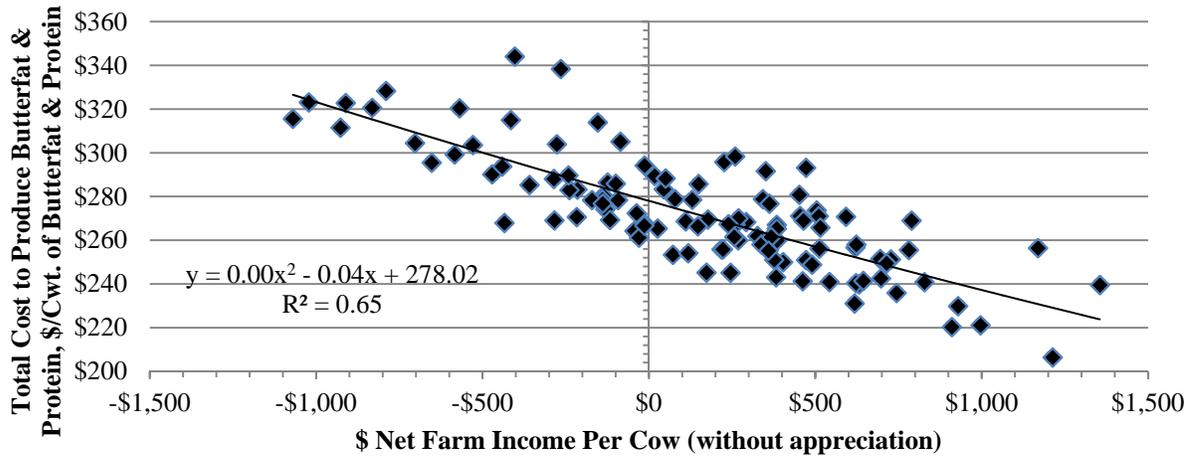
**RECEIPTS AND EXPENSES PER HUNDREDWEIGHT OF BUTTERFAT AND PROTEIN<sup>30</sup>**

Same 100 Large Herd Dairy Farms, 2015 &amp; 2016

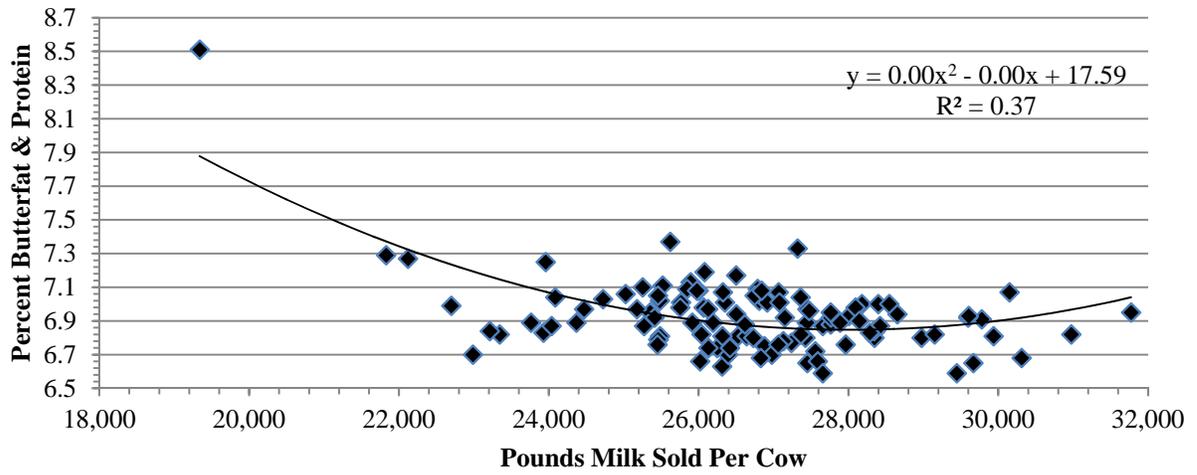
Item	Average Same 100 Large Herd Dairy Farms		Average Top 20% Farms	
	<u>2015</u>	<u>2016</u>	<u>2015</u>	<u>2016</u>
Cwt. of butterfat and protein sold	18,813	20,001	19,011	22,088
<u>Accrual Operating Receipts</u>				
Milk	\$263.69	\$249.55	\$274.44	\$243.77
Dairy cattle	27.18	22.74	29.10	24.85
Dairy calves	6.51	2.92	7.00	3.03
Other livestock	0.93	0.64	0.26	1.79
Crops	5.86	3.85	4.93	7.19
Miscellaneous receipts	<u>8.06</u>	<u>8.86</u>	<u>9.09</u>	<u>9.52</u>
Total Operating Receipts	\$312.22	\$288.55	\$324.82	\$290.15
<u>Accrual Operating Expenses</u>				
Hired labor	\$ 44.03	\$ 42.84	\$ 42.64	\$ 37.99
Dairy grain & concentrate	95.36	84.33	96.06	78.75
Dairy roughage	4.85	4.96	5.56	4.14
Nondairy feed	0.00	0.03	0.00	0.00
Professional nutritional services	0.05	0.09	0.01	0.08
Machine hire, rent & lease	7.59	7.13	8.33	8.21
Machine repair & vehicle expense	14.17	13.08	14.28	10.76
Fuel, oil & grease	8.29	6.24	8.88	5.82
Replacement livestock	0.49	0.58	0.20	0.90
Breeding	3.11	3.09	2.51	2.39
Veterinary & medicine	9.87	9.35	9.70	8.41
Milk marketing	13.72	14.03	14.65	14.23
Bedding	5.71	5.41	5.28	4.93
Milking supplies	5.51	5.05	4.39	3.84
Cattle lease	0.23	0.19	0.21	0.13
Custom boarding	6.26	5.89	6.25	5.22
bST expense	2.60	1.79	1.18	0.54
Livestock professional fees	0.84	0.84	0.83	0.78
Other livestock expense	1.23	0.94	1.68	0.98
Fertilizer & lime	8.23	6.21	9.75	5.75
Seeds & plants	7.17	6.70	6.50	5.75
Spray & other crop expense	3.37	3.40	3.33	3.24
Crop professional fees	0.34	0.49	0.20	0.22
Land, building & fence repair	5.15	4.14	5.05	3.06
Taxes	3.40	3.43	3.33	2.93
Real estate rent/lease	4.22	4.17	4.70	4.06
Insurance	3.28	2.54	2.93	2.46
Utilities	5.64	4.92	5.63	4.80
Interest paid	6.49	7.52	5.35	5.01
Other professional fees	1.76	1.50	1.10	1.03
Miscellaneous	<u>1.78</u>	<u>1.51</u>	<u>1.25</u>	<u>1.03</u>
Total Operating Expenses	\$274.75	\$252.37	\$271.80	\$227.43
Expansion livestock	1.24	2.04	1.91	0.49
Extraordinary expense	0.11	0.00	0.40	0.00
Machinery depreciation	13.54	13.58	12.97	12.25
Real Estate depreciation	<u>9.63</u>	<u>10.26</u>	<u>9.92</u>	<u>9.68</u>
Total Expenses	\$299.25	\$278.25	\$297.00	\$249.85
Net Farm Income without appreciation	\$ 12.97	\$ 10.30	\$ 27.82	\$ 40.31

<sup>30</sup>Average data for farms that provided complete milk component data for 2015 – 2016.

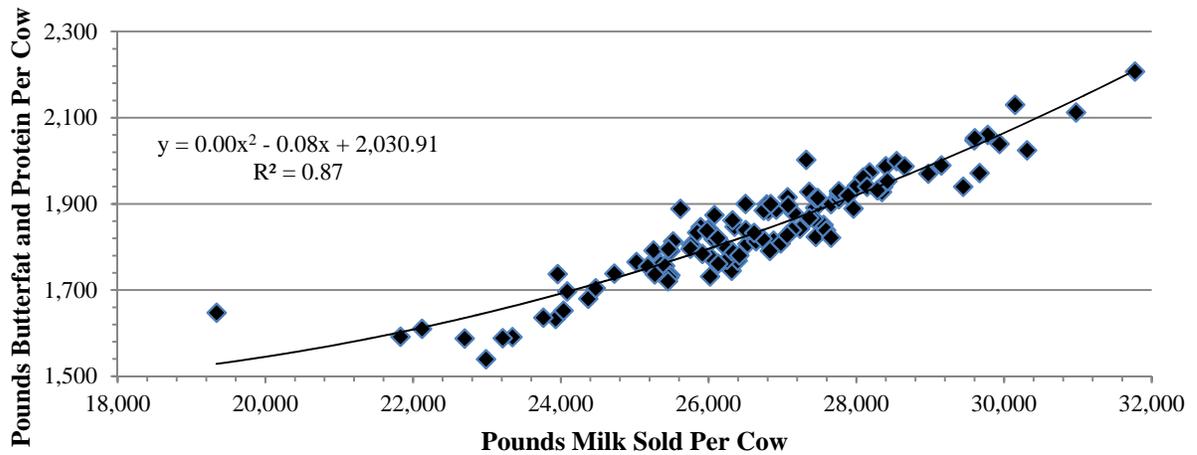
**TOTAL COST TO PRODUCE BUTTERFAT & PROTEIN VERSUS  
NET FARM INCOME PER COW  
109 Large Herd Dairy Farms, 2016**



**POUNDS MILK SOLD PER COW VERSUS PERCENT BUTTERFAT & PROTEIN  
109 Large Herd Dairy Farms, 2016**



**POUNDS OF BUTTERFAT AND PROTEIN PER COW VERSUS  
POUNDS MILK SOLD PER COW  
109 Large Herd Dairy Farms, 2016**



**Capital and Labor Efficiency Analysis**

Capital efficiency factors measure how intensively the capital is being used in the farm business. Measures of labor efficiency are key indicators of management's success in generating products per unit of labor input.

**CAPITAL EFFICIENCY**  
113 large Herd Dairy Farms, 2016

Item	Per Worker	Per Cow	Per Tillable Acre	Per Tillable Acre Owned
<u>Average 113 Farms:</u>				
Farm capital	\$ 549,979	\$ 11,737	\$ 6,062	\$ 11,639
Real estate		5,225		5,181
Machinery & equipment	88,886	1,897	980	
<u>Ratios</u>				
Asset turnover ratio	Operating Expense	Interest Expense	Depreciation Expense	
0.46	0.86	0.03	0.08	
<u>Average Top 20% Farms:</u>				
Farm capital	\$562,854	\$11,403	\$6,159	\$12,755
Real estate		4,562		5,103
Machinery & equipment	94,221	1,909	1,031	
<u>Ratios</u>				
Asset turnover ratio	Operating Expense	Interest Expense	Depreciation Expense	
0.49	0.77	0.02	0.08	

**LABOR FORCE INVENTORY AND ANALYSIS**

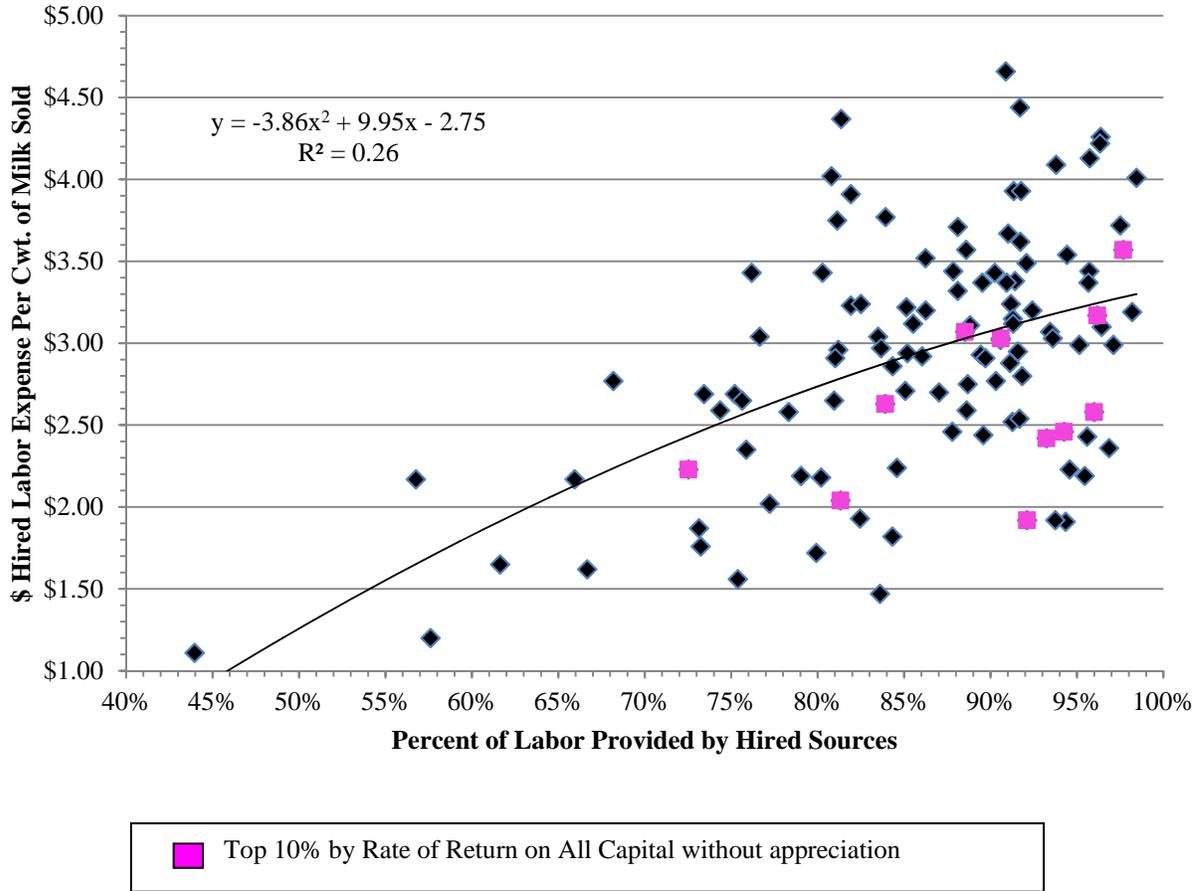
113 large Herd Dairy Farms, 2016

Labor Force	Months	Age	Years of Education	Value of Labor & Mgmt.		
Operator number 1	12.29	56	14	\$ 78,962		
Operator number 2	9.55	52	14	59,648		
Operator number 3	5.74	44	15	31,756		
Operator number 4	4.74	45	16	24,571		
Family paid	1.38					
Family unpaid	0.18					
Hired	<u>250.66</u>					
Total	284.54/	12 = 23.71 Worker Equivalent 2.45 Operator/Manager Equivalent				
<u>Average Top 20% Farms:</u>						
Total	285.76/	12 = 23.81 Worker Equivalent				
Operator's		2.26 Operator/Manager Equivalent				
Labor Efficiency	Average 113 Farms		Average Top 20% Farms			
	Total	Per Worker	Total	Per Worker		
Cows, average number	1,111	47	1,175	49		
Milk sold, pounds	29,482,356	1,243,369	31,090,110	1,305,576		
Tillable acres	2,151	91	2,176	91		
<u>Labor Costs</u>						
	Average 113 Farms			Average Top 20% Farms		
	Total	Per Cow	Per Cwt.	Total	Per Cow	Per Cwt.
Value of operator(s) labor (\$2,900/month)	\$ 93,728	\$ 84	\$ 0.32	\$ 87,029	\$ 74	\$ 0.28
Family Unpaid (\$2,660/month)	479	0	0.00	133	0	0.00
Hired	<u>863,233</u>	<u>777</u>	<u>2.93</u>	<u>839,158</u>	<u>714</u>	<u>2.70</u>
Total Labor	\$ 957,440	\$ 862	\$ 3.25	\$ 926,320	\$ 788	\$ 2.98
Machinery Cost	<u>911,255</u>	<u>820</u>	<u>3.09</u>	<u>930,439</u>	<u>792</u>	<u>2.99</u>
Total Labor & Machinery	\$1,868,695	\$ 1,682	\$ 6.34	\$1,856,759	\$ 1,580	\$ 5.97
Hired labor expense per hired worker equiv.		\$ 41,100		\$ 39,382		
Hired labor expense as % of milk sales		17.2%		15.6%		

**Labor Cost Evaluation**

Labor costs have been the second largest expense on large dairy farms in New York over multiple years. A key factor to track on these farms is hired labor expense per cwt. milk sold. The chart below shows the relationship between hired labor expenses per cwt. and percent of labor provided by hired labor sources and can be used to see how your farms' expense compares to other farms. To calculate percent of labor provided by hired sources use the worksheet below.

**HIRED LABOR EXPENSE PER CWT OF MILK SOLD VERSUS  
PERCENT OF LABOR PROVIDED BY HIRED SOURCES  
113 Large Herd Dairy Farms, 2016**



**Worksheet for Determining Percent of Labor From Hired Sources**

Divide total hired and family paid months of labor by the total months of labor provided from all sources. These values can be found on page 14 of your farm's Dairy Farm Business Summary report.

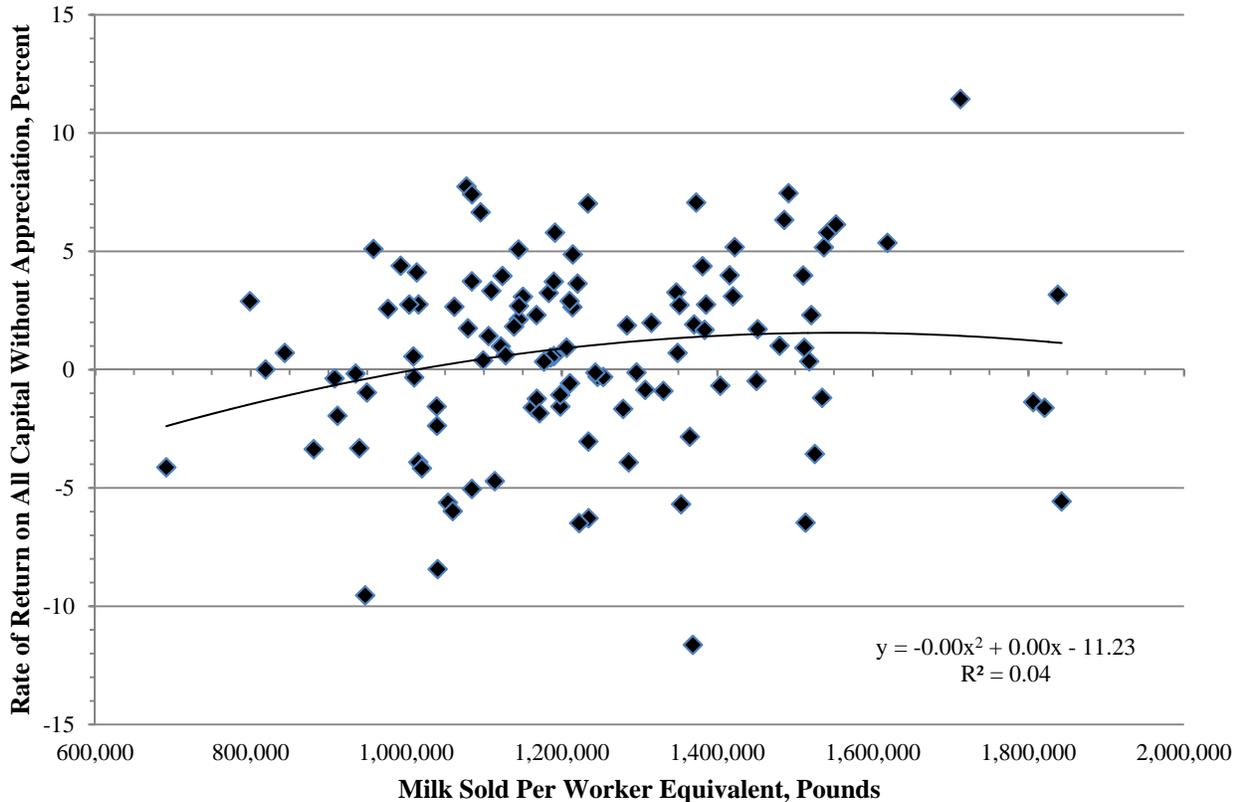
Months of hired labor		_____
Months of family paid labor	+	_____
 Total hired labor	=	_____
 Total Labor Months	÷	_____
 Percent of labor from hired sources	x 100 =	_____ %

The table below is the business chart for labor costs on a per worker and per hour basis and shows the range of costs for these farms. Hired labor expenses are all expenses that are associated with labor, and are not just payroll. The chart below shows the relationship between labor efficiency and return on all capital without appreciation. Labor efficiency improvements are one method that is used to allow the business to reward their employees while maintaining their labor costs per hundredweight of milk produced. A second area is improved cost control of day to day activities, which is one reason why some farms can generate higher than average profits while having some of the higher labor costs per hundredweight of milk sold.

**HIRED LABOR EXPENSE BUSINESS CHARTS**  
113 large Herd Dairy Farms, 2016

Decile	Hired Labor Expense per Cwt	Hired Labor Expense as % of Milk Sales	Hired Labor Expense per Hired Worker Equivalent	Hired Labor Expense per Hour
Average of Lowest Decile	\$1.63	9%	\$31,945	\$11.57
	2.13	13	34,755	12.59
	2.48	15	36,455	13.21
	2.69	16	37,848	13.71
	2.91	17	39,050	14.15
	3.04	18	40,243	14.58
	3.19	19	41,596	15.07
	3.41	20	44,081	15.97
	3.67	21	47,021	17.04
Average of Highest Decile	4.19	24	51,454	18.64

**RATE OF RETURN ON ALL CAPITAL WITHOUT APPRECIATION VERSUS MILK SOLD PER WORKER EQUIVALENT**  
113 Large Herd Dairy Farms, 2016



## CONDENSED SUMMARY &amp; SELECTED BUSINESS FACTORS

## CONDENSED FARM BUSINESS SUMMARY FOR THREE LARGE HERD GROUPS

113 large Herd Dairy Farms, 2016

Item	41 Farms with 300-799 Cows		37 Farms with 800-1,199 Cows		35 Farms with ≥ 1,200 Cows	
	Per Cow	Per Cwt.	Per Cow	Per Cwt.	Per Cow	Per Cwt.
<b>ACCRUAL EXPENSES</b>						
Hired labor	\$ 706	\$ 2.80	\$ 781	\$ 2.88	\$ 800	\$ 3.00
Dairy grain & concentrate	1,461	5.80	1,573	5.80	1,525	5.72
Dairy roughage	62	0.25	121	0.45	83	0.31
Nondairy feed	2	0.01	0	0.00	0	0.00
Professional nutritional services	2	0.01	2	0.01	1	0.00
Machine hire, rent & lease	200	0.79	138	0.51	103	0.39
Machine repairs & farm vehicle expense	229	0.91	226	0.83	246	0.92
Fuel, oil & grease	112	0.44	114	0.42	112	0.42
Replacement livestock	22	0.09	13	0.05	4	0.01
Breeding	57	0.22	58	0.22	56	0.21
Veterinary & medicine	164	0.65	179	0.66	170	0.64
Milk marketing	258	1.02	266	0.98	245	0.92
Bedding	106	0.42	110	0.41	89	0.33
Milking supplies	84	0.33	98	0.36	92	0.35
Cattle lease & rent	0	0.00	2	0.01	5	0.02
Custom boarding	98	0.39	139	0.51	119	0.45
bST expense	20	0.08	38	0.14	36	0.14
Livestock professional fees	17	0.07	16	0.06	14	0.05
Other livestock expense	21	0.08	14	0.05	17	0.06
Fertilizer & lime	148	0.59	106	0.39	102	0.38
Seeds & plants	116	0.46	118	0.43	125	0.47
Spray & other crop expense	63	0.25	60	0.22	64	0.24
Crop professional fees	5	0.02	7	0.02	11	0.04
Land, building & fence repair	60	0.24	78	0.29	75	0.28
Taxes & rent	150	0.60	140	0.51	137	0.51
Utilities	87	0.34	102	0.38	80	0.30
Interest paid	137	0.54	161	0.59	122	0.46
Other professional fees	30	0.12	27	0.10	26	0.10
Misc. (including insurance)	73	0.29	83	0.31	73	0.27
Total Operating Expenses	\$4,490	\$17.81	\$4,770	\$17.58	\$4,533	\$17.00
Expansion livestock	26	0.10	10	0.04	52	0.20
Extraordinary expense	0	0.00	0	0.00	0	0.00
Machinery depreciation	266	1.06	243	0.89	237	0.89
Building depreciation	178	0.71	183	0.67	187	0.70
Total Accrual Expenses	\$4,960	\$19.67	\$5,207	\$19.19	\$5,009	\$18.78
<b>ACCRUAL RECEIPTS</b>						
Milk sales	\$4,346	\$17.24	\$4,623	\$17.04	\$4,527	\$16.97
Dairy cattle	351	1.39	403	1.49	441	1.65
Dairy calves	57	0.23	50	0.18	52	0.19
Other livestock	-4	-0.02	38	0.14	3	0.01
Crops	132	0.52	54	0.20	62	0.23
Miscellaneous receipts	184	0.73	152	0.56	157	0.59
Total Accrual Receipts	\$5,065	\$20.09	\$5,320	\$19.61	\$5,243	\$19.66
<b>PROFITABILITY ANALYSIS (Total)</b>						
Net farm income (without appreciation)	\$59,408		\$112,631		\$438,805	
Net farm income (with appreciation)	\$163,480		\$295,380		\$854,472	
Labor & management income	-\$178,791		-\$263,329		-\$297,211	
Number of operators	2.27		2.37		2.73	
Labor & management income/operator	-\$78,762		-\$111,109		-\$108,869	
Rates of return on:						
Equity capital w/o apprec.	-1.8%		-0.8%		1.1%	
Equity capital w/ apprec.	0.4%		1.6%		3.9%	
All capital w/o apprec.	-0.1%		0.8%		1.8%	
All capital w/ apprec.	1.4%		2.3%		3.8%	

**SELECTED BUSINESS FACTORS FOR THREE LARGE HERD GROUPS**

113 large Herd Dairy Farms, 2016

Item	41 Farms with 300-799 Cows	37 Farms with 800-1,199 Cows	35 Farms with ≥ 1,200 Cows
<u>Cropping Program Analysis</u>			
Total Tillable acres	1,224	1,850	3,556
Tillable acres rented <sup>31</sup>	637	922	1,606
Hay crop acres <sup>31</sup>	573	791	1,397
Corn silage acres <sup>31</sup>	447	781	1,668
Hay crop, tons DM/acre	3.3	3.2	3.2
Corn silage, tons/acre	18.8	18.1	16.2
Forage DM per cow, tons	8.6	8.1	7.7
Tillable acres/cow	2.2	2.0	1.9
Fertilizer & lime expense/tillable acre	\$70.33	\$56.20	\$53.37
Machinery cost/tillable acre	\$423	\$429	\$416
<u>Dairy Analysis</u>			
Number of cows	567	993	1,873
Number of heifers	480	852	1,666
Milk sold, lbs.	14,298,314	26,938,476	49,958,622
Butterfat & protein, lbs./cow	1,763	1,880	1,845
Milk sold/cow, lbs.	25,212	27,131	26,671
Operating cost of prod. milk/cwt.	\$15.06	\$15.05	\$14.51
Total cost of prod. milk/cwt.	\$19.50	\$18.67	\$18.12
Price/cwt. milk sold	\$17.24	\$17.04	\$16.97
Purchased dairy feed/cow	\$1,523	\$1,693	\$1,608
Purchased dairy feed/cwt. milk	\$6.04	\$6.24	\$6.03
Purchased grain & concentrate as % of milk receipts	33%	34%	34%
Purchased feed & crop expense/cwt. milk	\$7.36	\$7.31	\$7.16
Net milk income over purchased feed costs per cow	\$2,626	\$2,785	\$2,757
<u>Capital Efficiency</u>			
Farm capital/worker	\$534,799	\$547,601	\$557,188
Farm capital/cow	\$11,986	\$12,012	\$11,494
Real estate/cow	\$5,109	\$5,407	\$5,164
Machinery investment/cow	\$2,112	\$1,928	\$1,803
Asset turnover ratio	0.44	0.46	0.48
<u>Labor Efficiency</u>			
Worker equivalent	12.71	21.78	38.64
Operator/manager equivalent	2.27	2.37	2.73
Milk sold/worker, lbs.	1,125,039	1,236,939	1,292,841
Cows/worker	45	46	48
Labor cost/cow	\$859	\$873	\$857
<u>Financial Measures</u>			
Percent equity	69%	62%	67%
Debt/asset ratio - long term	0.33	0.37	0.25
Debt/asset ratio - intermediate & current	0.30	0.39	0.40
Change in net worth with appreciation	\$-54,676	\$-91,459	\$196,976
Total farm debt per cow	\$3,574	\$4,532	\$3,838
Debt payments made per cow	\$665	\$694	\$548
Debt payments as % of milk sales	15%	15%	12%
Amount available for debt service	\$205,643	\$368,839	\$1,224,372
Debt coverage ratio for 2016	0.69	0.61	1.33

<sup>31</sup>Average of all farms, not only those reporting data.

### INCOME AND EXPENSE PROFILES BY HERD SIZE

Use two of the following six tables to make an income and expense profile for your dairy farm business. The first two tables represent farms with 300 to 799 cows. The second two tables are of farms with 800 to 1,199 cows. The third set of tables is of farms with 1,200 or more cows. The figures in the quintile columns represent the average of the top 20 percent to the bottom 20 percent for each receipt and expenditure category. Each row is computed independently. The farms that comprise the top 20 percent in milk sales do not necessarily make up the top 20 percent of any other category. On each row circle the income and cost measures closest to the one for your farm. Then draw a vertical line connecting your circles on each table. The strongest profile will be a relatively straight line on the left side of the table.

#### RECEIPTS AND EXPENSES PER COW 41 Large Herd Dairy Farms with 300 – 799 Cows, 2016

Item	QUINTILE				
	1	2	3	4	5
<u>Accrual Operating Receipts</u>					
Milk	\$3,570	\$4,270	\$4,509	\$4,697	\$4,951
Dairy cattle	189	272	349	414	531
Dairy calves	7	39	55	69	115
Other livestock	-52	0	0	1	44
Crops	-184	13	117	197	448
Miscellaneous receipts	38	73	112	180	469
<b>Total Operating Receipts</b>	<b>\$4,010</b>	<b>\$4,916</b>	<b>\$5,224</b>	<b>\$5,430</b>	<b>\$5,784</b>
<u>Accrual Operating Expenses</u>					
Hired labor	\$ 408	\$ 588	\$ 749	\$ 847	\$ 984
Dairy grain & concentrate	1,067	1,384	1,483	1,591	1,761
Dairy roughage	0	6	23	58	208
Nondairy feed	0	0	0	0	12
Professional nutritional services	0	0	0	0	9
Machinery hire/rent/lease	43	108	181	256	432
Mach. repair & farm vehicle exp.	110	178	207	278	404
Fuel, oil & grease	68	99	114	126	160
Replacement livestock	0	0	0	0	100
Breeding	17	43	59	70	101
Veterinary & medicine	92	144	165	193	236
Milk marketing	165	206	247	307	378
Bedding	34	71	106	139	192
Milking supplies	30	59	84	101	153
Cattle lease	0	0	0	0	1
Custom boarding	0	0	0	72	382
bST expense	0	0	0	8	95
Livestock professional fees	1	10	17	23	32
Other livestock expense	0	0	15	28	61
Fertilizer & lime	53	83	127	203	261
Seeds & plants	53	89	114	145	184
Spray/other crop expenses	9	38	53	81	132
Crop professional fees	0	0	1	8	17
Land, building, fence repair	21	39	57	75	111
Taxes	19	43	61	79	109
Real estate rent/lease	20	56	73	94	191
Insurance	25	41	52	64	74
Utilities	41	70	91	108	126
Interest	10	73	125	184	287
Other professional fees	12	23	29	37	54
Miscellaneous	7	15	22	30	43
<b>Total Operating Expenses</b>	<b>\$3,529</b>	<b>\$4,361</b>	<b>\$4,577</b>	<b>\$4,782</b>	<b>\$5,225</b>
Expansion livestock	0	0	0	0	120
Extraordinary expense	0	0	0	0	0
Machinery depreciation	116	201	287	338	413
Building depreciation	77	133	174	217	311
<b>Net Farm Income w/o Appreciation</b>	<b>\$ 720</b>	<b>\$ 420</b>	<b>\$ 192</b>	<b>\$ -175</b>	<b>\$ -655</b>

**RECEIPTS AND EXPENSES PER CWT. OF MILK SOLD**  
41 Large Herd Dairy Farms with 300 – 799 Cows, 2016

Item	QUINTILE				
	1	2	3	4	5
<u>Accrual Operating Receipts</u>					
Milk	\$16.39	\$16.96	\$17.20	\$17.54	\$18.61
Dairy cattle	0.82	1.05	1.35	1.59	2.10
Dairy calves	0.03	0.15	0.21	0.27	0.61
Other livestock	-0.43	0.00	0.00	0.00	0.23
Crops	-0.71	0.06	0.46	0.81	1.72
Miscellaneous receipts	0.15	0.31	0.44	0.70	1.88
<b>Total Operating Receipts</b>	<b>\$18.08</b>	<b>\$19.30</b>	<b>\$20.02</b>	<b>\$20.72</b>	<b>\$22.22</b>
<u>Accrual Operating Expenses</u>					
Hired labor	\$ 1.62	\$ 2.51	\$ 2.85	\$ 3.39	\$ 3.96
Dairy grain & concentrate	4.71	5.29	5.75	6.21	6.81
Dairy roughage	0.00	0.02	0.09	0.23	1.10
Nondairy feed	0.00	0.00	0.00	0.00	0.04
Professional nutritional services	0.00	0.00	0.00	0.00	0.04
Machinery hire/rent/lease	0.16	0.47	0.72	1.02	1.71
Mach. repair & farm vehicle exp.	0.48	0.68	0.82	1.11	1.52
Fuel, oil & grease	0.30	0.39	0.43	0.48	0.63
Replacement livestock	0.00	0.00	0.00	0.00	0.39
Breeding	0.07	0.17	0.22	0.28	0.37
Veterinary & medicine	0.41	0.54	0.65	0.72	0.94
Milk marketing	0.71	0.81	0.98	1.20	1.46
Bedding	0.15	0.29	0.40	0.53	0.74
Milking supplies	0.13	0.24	0.33	0.40	0.61
Cattle lease	0.00	0.00	0.00	0.00	0.00
Custom boarding	0.00	0.00	0.00	0.27	1.42
bST expense	0.00	0.00	0.00	0.03	0.37
Livestock professional fees	0.01	0.04	0.06	0.09	0.13
Other livestock expense	0.00	0.00	0.06	0.11	0.26
Fertilizer & lime	0.21	0.31	0.49	0.80	1.22
Seeds & plants	0.23	0.34	0.44	0.54	0.72
Spray/other crop expenses	0.04	0.15	0.21	0.31	0.50
Crop professional fees	0.00	0.00	0.00	0.03	0.08
Land, building, fence repair	0.10	0.15	0.21	0.29	0.45
Taxes	0.08	0.17	0.23	0.31	0.47
Real estate rent/lease	0.08	0.22	0.28	0.39	0.81
Insurance	0.10	0.16	0.21	0.25	0.29
Utilities	0.18	0.29	0.35	0.41	0.48
Interest	0.04	0.28	0.51	0.77	1.13
Other professional fees	0.05	0.09	0.11	0.15	0.22
Miscellaneous	0.03	0.06	0.09	0.12	0.16
<b>Total Operating Expenses</b>	<b>\$15.63</b>	<b>\$16.58</b>	<b>\$17.53</b>	<b>\$18.96</b>	<b>\$20.62</b>
Expansion livestock	0.00	0.00	0.00	0.00	0.49
Extraordinary expense	0.00	0.00	0.00	0.00	0.00
Machinery depreciation	0.50	0.79	1.07	1.30	1.63
Building depreciation	0.32	0.52	0.69	0.86	1.25
<b>Net Farm Income w/o Appreciation</b>	<b>\$ 2.72</b>	<b>\$ 1.63</b>	<b>\$ 0.72</b>	<b>\$ -0.70</b>	<b>\$ -2.76</b>

**RECEIPTS AND EXPENSES PER COW**  
37 Large Herd Dairy Farms with 800 – 1,199 Cows, 2016

Item	QUINTILE				
	1	2	3	4	5
<u>Accrual Operating Receipts</u>					
Milk	\$4,179	\$4,494	\$4,661	\$4,788	\$5,071
Dairy cattle	211	342	402	465	637
Dairy calves	13	40	49	64	88
Other livestock	-1	0	0	26	185
Crops	-193	-23	70	157	354
Miscellaneous receipts	64	104	137	175	291
<b>Total Operating Receipts</b>	<b>\$4,695</b>	<b>\$5,035</b>	<b>\$5,350</b>	<b>\$5,627</b>	<b>\$6,076</b>
<u>Accrual Operating Expenses</u>					
Hired labor	\$ 521	\$ 673	\$ 819	\$ 877	\$1,064
Dairy grain & concentrate	1,251	1,510	1,579	1,665	1,903
Dairy roughage	4	29	63	106	445
Nondairy feed	0	0	0	0	1
Professional nutritional services	0	0	0	0	10
Machinery hire/rent/lease	9	43	122	189	358
Mach. repair & farm vehicle exp.	122	199	246	281	312
Fuel, oil & grease	71	99	113	131	168
Replacement livestock	0	0	0	0	81
Breeding	22	40	54	71	115
Veterinary & medicine	122	157	182	209	245
Milk marketing	160	224	275	317	378
Bedding	44	84	105	135	195
Milking supplies	45	71	92	112	174
Cattle lease	0	0	0	0	15
Custom boarding	0	0	55	210	476
bST expense	0	0	0	77	133
Livestock professional fees	3	12	16	19	36
Other livestock expense	0	0	7	15	53
Fertilizer & lime	30	69	99	144	202
Seeds & plants	40	97	118	151	200
Spray/other crop expenses	15	36	59	80	125
Crop professional fees	0	0	1	10	24
Land, building, fence repair	32	57	76	92	148
Taxes	26	44	59	77	103
Real estate rent/lease	18	46	68	107	164
Insurance	27	37	48	59	82
Utilities	63	79	103	124	154
Interest	49	128	167	204	281
Other professional fees	9	18	26	37	51
Miscellaneous	10	19	29	45	70
<b>Total Operating Expenses</b>	<b>\$3,928</b>	<b>\$4,455</b>	<b>\$4,753</b>	<b>\$5,246</b>	<b>\$5,696</b>
Expansion livestock	0	0	0	1	54
Extraordinary expense	0	0	0	0	1
Machinery depreciation	106	200	246	301	390
Building depreciation	66	155	202	237	282
<b>Net Farm Income w/o Appreciation</b>	<b>\$ 832</b>	<b>\$ 420</b>	<b>\$ 130</b>	<b>\$ -137</b>	<b>\$ -613</b>

**RECEIPTS AND EXPENSES PER CWT. OF MILK SOLD**  
37 Large Herd Dairy Farms with 800 – 1,199 Cows, 2016

Item	QUINTILE				
	1	2	3	4	5
<u>Accrual Operating Receipts</u>					
Milk	\$16.25	\$16.81	\$17.07	\$17.30	\$17.84
Dairy cattle	0.78	1.30	1.44	1.70	2.32
Dairy calves	0.05	0.15	0.18	0.24	0.33
Other livestock	-0.01	0.00	0.00	0.09	0.69
Crops	-0.71	-0.09	0.26	0.58	1.30
Miscellaneous receipts	0.24	0.37	0.51	0.65	1.10
Total Operating Receipts	\$18.05	\$19.02	\$19.39	\$20.19	\$21.81
<u>Accrual Operating Expenses</u>					
Hired labor	\$ 1.95	\$ 2.43	\$ 3.03	\$ 3.32	\$ 3.83
Dairy grain & concentrate	4.82	5.56	5.83	6.14	6.68
Dairy roughage	0.01	0.11	0.24	0.39	1.52
Nondairy feed	0.00	0.00	0.00	0.00	0.00
Professional nutritional services	0.00	0.00	0.00	0.00	0.04
Machinery hire/rent/lease	0.03	0.16	0.46	0.68	1.31
Mach. repair & farm vehicle exp.	0.45	0.72	0.90	1.04	1.17
Fuel, oil & grease	0.26	0.36	0.43	0.49	0.62
Replacement livestock	0.00	0.00	0.00	0.00	0.29
Breeding	0.08	0.14	0.19	0.26	0.44
Veterinary & medicine	0.46	0.59	0.67	0.75	0.89
Milk marketing	0.62	0.83	1.02	1.14	1.36
Bedding	0.17	0.31	0.38	0.49	0.72
Milking supplies	0.17	0.27	0.34	0.41	0.63
Cattle lease	0.00	0.00	0.00	0.00	0.06
Custom boarding	0.00	0.00	0.21	0.78	1.71
bST expense	0.00	0.00	0.00	0.27	0.47
Livestock professional fees	0.01	0.05	0.06	0.07	0.14
Other livestock expense	0.00	0.00	0.03	0.06	0.20
Fertilizer & lime	0.11	0.26	0.37	0.53	0.75
Seeds & plants	0.15	0.36	0.45	0.54	0.74
Spray/other crop expenses	0.06	0.14	0.21	0.30	0.46
Crop professional fees	0.00	0.00	0.01	0.04	0.09
Land, building, fence repair	0.12	0.21	0.26	0.33	0.57
Taxes	0.09	0.16	0.22	0.28	0.40
Real estate rent/lease	0.07	0.17	0.26	0.40	0.60
Insurance	0.10	0.13	0.18	0.22	0.29
Utilities	0.24	0.30	0.38	0.46	0.56
Interest	0.18	0.47	0.62	0.76	1.04
Other professional fees	0.03	0.06	0.10	0.14	0.19
Miscellaneous	0.04	0.07	0.11	0.16	0.26
Total Operating Expenses	\$15.16	\$16.46	\$17.78	\$18.92	\$20.09
Expansion livestock	0.00	0.00	0.00	0.00	0.20
Extraordinary expense	0.00	0.00	0.00	0.00	0.00
Machinery depreciation	0.38	0.73	0.91	1.12	1.49
Building depreciation	0.24	0.58	0.73	0.87	1.08
Net Farm Income w/o Appreciation	\$ 3.15	\$ 1.56	\$ 0.64	\$ -0.44	\$ -2.29

**RECEIPTS AND EXPENSES PER COW**  
35 Large Herd Dairy Farms with 1,200 or More Cows, 2016

Item	QUINTILE				
	1	2	3	4	5
<u>Accrual Operating Receipts</u>					
Milk	\$4,135	\$4,409	\$4,556	\$4,680	\$4,958
Dairy cattle	244	359	404	468	707
Dairy calves	8	37	50	69	98
Other livestock	-18	0	0	0	47
Crops	-128	9	64	132	311
Miscellaneous receipts	58	99	138	194	323
<b>Total Operating Receipts</b>	<b>\$4,618</b>	<b>\$5,038</b>	<b>\$5,276</b>	<b>\$5,519</b>	<b>\$5,956</b>
<u>Accrual Operating Expenses</u>					
Hired labor	\$ 584	\$ 709	\$ 797	\$ 865	\$1,047
Dairy grain & concentrate	1,253	1,399	1,527	1,647	1,855
Dairy roughage	0	12	37	108	250
Nondairy feed	0	0	0	0	0
Professional nutritional services	0	0	0	0	6
Machinery hire/rent/lease	12	43	71	128	231
Mach. repair & farm vehicle exp.	159	208	240	282	365
Fuel, oil & grease	86	95	106	119	153
Replacement livestock	0	0	0	0	23
Breeding	22	45	55	69	90
Veterinary & medicine	101	134	172	204	252
Milk marketing	132	193	254	302	375
Bedding	27	55	86	116	153
Milking supplies	40	61	81	118	142
Cattle lease	0	0	0	0	14
Custom boarding	0	0	3	40	433
bST expense	0	0	0	32	132
Livestock professional fees	1	9	14	18	29
Other livestock expense	0	0	5	25	62
Fertilizer & lime	44	78	97	123	181
Seeds & plants	70	104	127	148	194
Spray/other crop expenses	17	46	65	83	130
Crop professional fees	0	0	0	6	39
Land, building, fence repair	21	43	63	92	152
Taxes	29	55	62	75	106
Real estate rent/lease	25	42	65	98	151
Insurance	21	34	45	60	87
Utilities	43	63	79	101	122
Interest	22	99	141	164	207
Other professional fees	5	15	21	36	61
Miscellaneous	6	14	22	30	63
<b>Total Operating Expenses</b>	<b>\$3,960</b>	<b>\$4,212</b>	<b>\$4,465</b>	<b>\$4,816</b>	<b>\$5,251</b>
Expansion livestock	0	0	0	7	173
Extraordinary expense	0	0	0	0	0
Machinery depreciation	129	191	249	297	402
Building depreciation	91	155	183	236	311
<b>Net Farm Income w/o Appreciation</b>	<b>\$ 817</b>	<b>\$ 447</b>	<b>\$ 281</b>	<b>\$ 36</b>	<b>\$ -301</b>

**RECEIPTS AND EXPENSES PER CWT. OF MILK SOLD**  
35 Large Herd Dairy Farms with 1,200 or More Cows, 2016

Item	QUINTILE				
	1	2	3	4	5
<u>Accrual Operating Receipts</u>					
Milk	\$16.35	\$16.54	\$16.78	\$17.40	\$17.98
Dairy cattle	0.94	1.35	1.48	1.75	2.60
Dairy calves	0.03	0.13	0.20	0.25	0.37
Other livestock	-0.07	0.00	0.00	0.00	0.18
Crops	-0.48	0.03	0.24	0.51	1.14
Miscellaneous receipts	0.21	0.38	0.51	0.72	1.22
Total Operating Receipts	\$17.91	\$18.81	\$19.53	\$20.47	\$22.03
<u>Accrual Operating Expenses</u>					
Hired labor	\$2.15	\$2.71	\$3.01	\$3.19	\$3.95
Dairy grain & concentrate	4.93	5.24	5.76	6.13	6.61
Dairy roughage	0.00	0.04	0.13	0.40	0.93
Nondairy feed	0.00	0.00	0.00	0.00	0.00
Professional nutritional services	0.00	0.00	0.00	0.00	0.02
Machinery hire/rent/lease	0.04	0.16	0.26	0.48	0.90
Mach. repair & farm vehicle exp.	0.59	0.75	0.90	1.07	1.41
Fuel, oil & grease	0.31	0.35	0.41	0.44	0.59
Replacement livestock	0.00	0.00	0.00	0.00	0.08
Breeding	0.09	0.16	0.21	0.25	0.34
Veterinary & medicine	0.39	0.50	0.63	0.73	0.98
Milk marketing	0.51	0.74	0.96	1.09	1.38
Bedding	0.10	0.21	0.33	0.42	0.59
Milking supplies	0.15	0.22	0.30	0.45	0.54
Cattle lease	0.00	0.00	0.00	0.00	0.05
Custom boarding	0.00	0.00	0.01	0.15	1.62
bST expense	0.00	0.00	0.00	0.12	0.48
Livestock professional fees	0.00	0.03	0.05	0.07	0.11
Other livestock expense	0.00	0.00	0.02	0.09	0.23
Fertilizer & lime	0.16	0.29	0.37	0.46	0.68
Seeds & plants	0.27	0.38	0.48	0.55	0.74
Spray/other crop expenses	0.06	0.17	0.24	0.33	0.49
Crop professional fees	0.00	0.00	0.00	0.02	0.14
Land, building, fence repair	0.08	0.16	0.24	0.35	0.56
Taxes	0.11	0.21	0.23	0.28	0.39
Real estate rent/lease	0.09	0.15	0.24	0.37	0.56
Insurance	0.08	0.13	0.17	0.22	0.32
Utilities	0.16	0.24	0.30	0.37	0.45
Interest	0.08	0.38	0.54	0.61	0.75
Other professional fees	0.02	0.06	0.08	0.13	0.22
Miscellaneous	0.02	0.05	0.08	0.11	0.24
Total Operating Expenses	\$15.11	\$16.02	\$16.57	\$17.78	\$19.49
Expansion livestock	0.00	0.00	0.00	0.03	0.65
Extraordinary expense	0.00	0.00	0.00	0.00	0.00
Machinery depreciation	0.50	0.74	0.91	1.10	1.48
Building depreciation	0.36	0.59	0.70	0.85	1.11
Net Farm Income w/o Appreciation	\$ 3.06	\$ 1.68	\$1.05	\$ 0.13	\$ -1.12

## FARM BUSINESS CHART

The Farm Business Chart is a tool which can be used in analyzing your business. Compare your business by drawing a line through or near the figure in each column which represents your current level of performance. The ten figures in each column represent the average of each 10 percent or decile of farms included in this summary. Each column of the chart is independent of the others. The farms which are in the top 10 percent for one factor would not necessarily be the same farms which make up the 10 percent for any other factor. Use this information to identify business areas where more challenging goals are needed.

### FARM BUSINESS CHART FOR FARM MANAGEMENT COOPERATORS

113 large Herd Dairy Farms, 2016

Size of Business		Rates of Production			Labor Efficiency		
Worker Equivalent	Number of Cows	Pounds Milk Sold	Pounds Milk Sold Per Cow	Tons Hay Crop DM/Acre	Tons Corn Silage Per Acre	Cows Per Worker	Pounds Milk Sold Per Worker
(14) <sup>32</sup>	(12)	(12)	(12)	(11)	(11)	(14)	(14)
53.6	2,681	71,783,434	30,035	5.2	24	66	1,666,332
35.3	1,730	44,866,498	28,422	4.2	22	55	1,486,946
30.3	1,330	36,368,154	27,791	3.9	20	52	1,383,503
25.7	1,157	31,682,298	27,346	3.6	19	50	1,308,883
22.7	1,051	28,091,247	26,908	3.3	18	47	1,225,648
19.9	908	25,217,040	26,483	3.1	17	45	1,187,089
17.5	795	21,033,147	26,108	2.9	16	43	1,139,916
15.0	681	16,989,274	25,638	2.6	15	42	1,082,873
11.8	543	13,588,883	24,885	2.3	14	38	1,014,749
8.5	391	9,592,365	20,920	1.3	9	34	881,881

### Cost Control

Grain Bought Per Cow	% Grain is of Milk Receipts	Net Milk Income Over Purchased Feed Cost Per Cow	Machinery Costs Per Cow	Labor & Machinery Costs Per Cow	Feed & Crop Expenses Per Cow	Feed & Crop Expenses Per Cwt. Milk
(12)	(12)	(CALC)	(14)	(14)	(12)	(12)
1,082	27%	\$3,255	\$514	\$1,139	\$1,463	\$5.99
1,298	30	2,996	704	1,455	1,623	6.47
1,392	31	2,924	762	1,583	1,745	6.74
1,460	33	2,837	793	1,667	1,837	7.01
1,519	33	2,782	837	1,749	1,891	7.17
1,568	34	2,701	869	1,801	1,946	7.30
1,599	35	2,623	914	1,848	2,012	7.47
1,653	37	2,532	968	1,910	2,089	7.77
1,755	38	2,463	1,054	1,997	2,201	8.10
1,937	41	2,122	1,207	2,218	2,446	9.04

<sup>32</sup>( ) = page number of the participant's DFBS where factor is located.

CALC=Need to calculate for each farm; refer to the Glossary for definition.

Cost Control (con't)					
Hired Labor Expense			Expenses Per Cwt.		
Per Cwt.	Per Hired Worker Equiv.	As % of Milk Sales	Milk Marketing	Veterinary & Medicine	Other Livestock
(14)	(14)	(14)	(15)	(15)	(15)
\$1.63	\$31,945	9%	\$0.53	\$0.38	\$0.00
2.13	34,755	13	0.70	0.46	0.00
2.48	36,455	15	0.77	0.53	0.00
2.69	37,848	16	0.86	0.58	0.00
2.91	39,050	17	0.95	0.63	0.02
3.04	40,243	18	1.01	0.68	0.05
3.19	41,596	19	1.10	0.70	0.07
3.41	44,081	20	1.19	0.76	0.10
3.67	47,021	21	1.27	0.86	0.15
4.19	51,454	24	1.54	1.02	0.32

Cost of Producing Milk					
Machinery & Crop Expense		Operating Cost		Total Cost	
Per Tillable Acre	Per Ton Dry Matter	Per Cow	Per Cwt.	Per Cow	Per Cwt.
(CALC)	(CALC)	(12)	(12)	(12)	(12)
\$405	\$96	\$2,890	\$11.88	\$3,805	\$16.04
477	119	3,367	13.07	4,527	17.16
506	126	3,605	13.66	4,691	17.64
552	134	3,723	14.03	4,800	18.13
586	141	3,851	14.40	4,865	18.51
608	147	3,953	15.02	5,030	18.93
628	154	4,084	15.58	5,151	19.32
671	163	4,312	16.19	5,341	20.03
782	193	4,525	17.05	5,594	20.76
1,149	285	5,008	18.54	5,977	22.73

bST Expense Per Cow	bST Expense Per Cwt.	Culling Rate	Expense Ratios		
(12)	(12)	(12)	Operating	Depreciation	Interest
(12)	(12)	(12)	(14)	(14)	(14)
\$0	\$0.00	14%	0.73	0.04	0.00
0	0.00	27	0.77	0.06	0.01
0	0.00	29	0.80	0.07	0.02
0	0.00	31	0.83	0.08	0.02
0	0.00	33	0.85	0.08	0.03
0	0.00	35	0.87	0.09	0.03
4	0.01	37	0.89	0.10	0.03
57	0.21	38	0.92	0.10	0.04
109	0.40	41	0.96	0.11	0.05
142	0.52	47	1.04	0.14	0.06

## Income Generation

Milk Receipts Per Cwt.	Net Milk Receipts Per Cwt.	Milk Receipts Per Cow	Dairy Cattle Sales Per Cow	Dairy Calf Sales Per Cow
(12)	(12)	(12)	(12)	(12)
\$18.55	\$17.58	\$5,114	\$722	\$115
17.82	16.85	4,882	535	88
17.54	16.53	4,755	460	75
17.32	16.37	4,690	427	60
17.13	16.15	4,622	400	55
17.02	16.00	4,537	376	49
16.84	15.86	4,452	349	42
16.66	15.68	4,361	309	38
16.48	15.50	4,204	260	25
16.10	15.12	3,616	152	-5

## Debt Management

Farm Debt Per Cow		Cost of	Planned Debt Payments	
Total	Intermediate & Long Term	Borrowed Capital	Per Cow	Per Cwt.
(7)	(7)	(7)	(10)	(10)
\$488	\$168	1.6%	\$15	\$0.00
1,693	1,049	3.8	204	0.92
2,839	1,893	4.0	308	1.00
3,510	2,718	4.0	407	1.82
3,920	3,275	4.0	489	2.00
4,345	3,553	4.0	556	2.00
5,018	4,009	4.0	649	2.36
5,554	4,463	4.0	726	3.00
6,183	4,946	4.5	844	3.09
7,492	6,216	6.8	1,063	4.09

## Cash Flow Analysis

Amount Available for Family Living, Debt Service & Investment		Personal Withdrawals & Family Expenditures		Cash Flow Coverage Ratio
Per Cow	Per Cwt.	Per Cow	Per Cwt.	Ratio
(16)	(16)	(CALC)	(CALC)	(10)
\$1,539	\$6.21	\$1,101	\$4.46	13.73
1,243	4.65	435	1.66	2.90
1,081	4.15	320	1.21	1.98
968	3.62	266	1.02	1.40
859	3.27	225	0.85	1.00
737	2.83	184	0.71	0.77
593	2.32	161	0.60	0.60
428	1.67	130	0.50	0.34
254	0.96	103	0.38	0.07
-23	-0.09	48	0.18	-1.27

## Capital Efficiency

Farm Capital Per Cow	Real Estate Investment Per Cow	Machinery Investment Per Cow	Total Labor Cost Per Worker Equivalent	Asset Turnover Ratio
(14)	(14)	(14)	(CALC)	(14)
\$7,153	\$2,314	\$653	\$32,454	0.76
9,418	3,546	1,177	34,731	0.58
10,197	3,998	1,514	36,182	0.52
10,734	4,358	1,708	37,223	0.51
11,771	4,770	1,911	38,491	0.49
12,635	5,351	2,201	39,638	0.47
13,147	6,052	2,445	40,761	0.43
13,587	6,461	2,622	42,840	0.39
14,841	7,357	2,811	45,154	0.36
16,684	8,986	3,236	49,933	0.31

Solvency					Liquidity	
Percent Equity	Leverage Ratio	Debt to Asset Ratios			Working Capital as % of Total Expenses	Current Ratio
		Total	Current/Intermediate	Long Term		
(7)	(7)	(7)	(7)	(7)	(7)	(7)
97%	-0.78	0.04	0.04	0.00	60%	42.02
87	0.16	0.15	0.17	0.03	38	6.52
77	0.31	0.24	0.23	0.13	29	3.92
71	0.42	0.30	0.28	0.25	25	2.93
66	0.55	0.36	0.33	0.30	22	2.47
60	0.67	0.40	0.38	0.35	17	2.09
58	0.75	0.43	0.46	0.41	14	1.70
53	0.92	0.48	0.50	0.48	8	1.38
48	1.10	0.53	0.59	0.57	4	1.12
36	1.52	0.65	0.85	1.28	-14	0.57

Profitability				
Labor and Mgmt. Income Per Operator	Rate Return to Equity Capital		Rate Return to All Capital	
	Without Appreciation	With Appreciation	Without Appreciation	With Appreciation
(4)	(4)	(4)	(4)	(4)
\$343,311	8.27%	12.53%	7.17%	9.67%
80,878	5.31	9.06	4.69	7.39
17,775	3.28	6.79	3.38	5.76
-9,758	2.08	4.71	2.64	4.36
-46,562	0.74	2.62	1.66	2.93
-93,879	-0.87	1.41	0.60	2.16
-134,518	-2.48	-0.22	-0.31	1.36
-223,196	-4.51	-1.79	-1.30	-0.01
-386,379	-7.56	-5.80	-3.20	-1.73
-766,587	-17.08	-13.77	-6.79	-6.23

Profitability, Continued				
Net Farm Income Without Appreciation		Net Farm Income From Operations	Net Income Efficiency	
Per Cow	Per Cwt.	Ratio	Ratio	
(12)	(12)	(4)	(CALC)	
\$949	\$3.57	17%	12%	
636	2.39	12	6	
482	1.83	9	4	
374	1.42	7	3	
281	1.07	5	3	
159	0.59	3	2	
5	0.01	0	1	
-134	-0.50	-3	0	
-322	-1.27	-7	-2	
-755	-2.98	-16	-8	

## IDENTIFY AND SET GOALS

If businesses are to be successful, they must have direction. Written goals help provide businesses with an identifiable direction over both the long and short term. Goal setting is as important on a dairy farm as it is in other businesses. Written goals are a tool which farm operators can use to ensure that the business continues to move in the proper direction. Goals should be SMART:

1. Goals should be Specific.
2. Goals should be Measurable.
3. Goals should be Achievable but challenging.
4. Goals should be Rewarding.
5. Goals should designate a Time when each goal will be achieved.

Goal setting on a dairy farm does not have to be a complex process. In many cases it provides a process for writing down and agreeing on goals that you have already given some thought to. It is also important to remember that once you write out your goals they are not cast in concrete. If a change takes place which has a major impact on the farm business, the goals should be reworked to accommodate that change. Refer to your goals as often as necessary to keep the farm business progressing.

It is important to identify both objectives (long-range) and goals (short-range) when looking at the future of your farm business.

A suggested format for writing out your goals is as follows:

- a. Begin with a mission statement which describes why the business exists based on the preferences and values of the owners.
- b. Identify 4-6 objectives.
- c. Identify SMART goals.

### Worksheet for Setting Goals

#### I. Mission and Objectives

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## GLOSSARY AND LOCATION OF COMMON TERMS

Some of the following definitions include formulas for calculating the factor being described. Page references to the individual Dairy Farm Business Summary are provided in parentheses for ease of calculation for your farm.

**Accounts Payable** - Open accounts or bills owed to feed and supply firms, cattle dealers, veterinarians and other providers of farm services and supplies.

**Accounts Receivable** - Outstanding receipts from items sold or sales proceeds not yet received, such as the payment for December milk sales received in January.

**Accrual Expenses** - (defined on page 13).

**Accrual Receipts** - (defined on page 13).

**Annual Cash Flow Statement** - (defined on page 20).

**Appreciation** - (defined on page 14).

**Asset Turnover Ratio** - The ratio of total farm income to total farm assets, calculated by dividing total accrual operating receipts plus appreciation by average total farm assets.

**Balance Sheet** - A "snapshot" of the business financial position at a given point in time, usually December 31. The balance sheet equates the value of assets to liabilities plus net worth.

**Capital Efficiency** - The amount of capital invested per production unit. Relatively high investments per worker with low to moderate investments per cow imply efficient use of capital.

**Cash From Nonfarm Capital Used in the Business** - Transfers of money from nonfarm savings or investments to the farm business where it is used to pay operating expenses, make debt payments and/or capital purchases.

**Cash Flow Coverage Ratio** - (defined on page 22).

**Cash Paid** - (defined on page 11).

**Cash Receipts** - (defined on page 13).

**Change in Accounts Payable** - (defined on page 11).

**Change in Accounts Receivable** - (defined on page 11).

**Change in Inventory** - (defined on page 11).

**Cost of Borrowed Capital** - A weighted average of the cost of borrowed capital to the farm. Calculate by multiplying end of year principal of each loan that is borrowed by the interest rate for each loan at that time. Add up each amount that is calculated for each loan and then divide by total amount of borrowed funds. Do not include accounts payable. This information is found on pages 10 & 11 of the data entry form.

**Cows per Worker Equivalent for the Dairy Enterprise** - Determined by dividing the average number of milking and dry cows by the number of worker equivalents in the dairy enterprise.

**Culling Rate** - Culling rate is calculated by dividing the number of animals that left the herd for culling purposes and that died by the average number of milking and dry cows for the year.

**Current Portion** - (defined on page 16).

**Dairy (farm)** - A farm business where dairy farming is the primary enterprise, operating and managing this farm is a full-time occupation for one or more people and cropland is owned.

**Dairy Enterprise Only** – Dairy enterprise only represents the estimate of labor hours, hired and family, that was utilized to operate the dairy. This estimate includes all labor to milk, feed, scrape, and take care of the milking and dry cows. Labor to take care of dairy replacements, produce crops, and spread manure was excluded. Labor efficiency numbers calculated for the dairy enterprise only help evaluate the labor efficiency of the dairy and the overall business.

**Debt Coverage Ratio** – (defined on page 22).

**Debt Per Cow** - Total end-of-year debt divided by end-of-year number of cows.

**Debt to Asset Ratios** - (defined on page 18).

**Depreciation Expense Ratio** - The percentage of Total Accrual Receipts that is charged to depreciation expense. Machinery Depreciation (DFBS p. 3) plus Building Depreciation (p. 3) divided by Total Accrual Receipts (p. 3) times 100.

**Dry Matter** - The amount or proportion of dry material that remains after all water is removed. Commonly used to measure dry matter percent and tons of dry matter in feed.

**Equity Capital** - The farm operator/manager's owned capital or farm net worth.

**Expansion Livestock** - Purchased dairy cattle and other livestock that cause an increase in herd size from the beginning to the end of the year.

**Farm Debt Payments as Percent of Milk Sales** - Amount of milk income committed to debt repayment, calculated by dividing planned debt payments by total milk receipts. A reliable measure of repayment ability, see page 22.

**Farm Debt Payments Per Cow** - Planned or scheduled debt payments per cow represent the repayment plan scheduled at the beginning of the year divided by the average number of cows for the year. This measure of repayment ability is used in the Financial Analysis Chart.

**Financial Lease** - A long-term non-cancellable contract giving the lessee use of an asset in exchange for a series of lease payments. The term of a financial lease usually covers a major portion of the economic life of the asset. The lease is a substitute for purchase. The lessor retains ownership of the asset.

**Hired Labor Expense per Hired Worker Equivalent** - The total cost to the farm per hired worker equivalent. Divide accrual hired labor expense (DFBS p. 2) by number of hired plus family paid worker equivalents (p. 14).

**Hired Labor Expense as % of Milk Sales** - The percentage of the gross milk receipts that is used for labor expense. Divide accrual hired labor expense (DFBS p. 2) by accrual milk sales (p. 3).

**Income Statement** - A complete and accurate account of farm business receipts and expenses used to measure profitability over a period of time such as one year or one month.

**Interest Expense Ratio** - The percentage of Total Accrual Receipts that is used for interest expense. Total Accrual Interest (DFBS p. 3) divided by Total Accrual Receipts (p. 3) times 100.

**Labor and Management Income** - (defined on page 15).

**Labor and Management Income Per Operator** - The return to the owner/manager's labor and management per full-time operator.

**Labor Efficiency** - Production capacity and output per worker.

**Leverage Ratio** - Dollars of debt per dollar of equity, computed by dividing total liabilities by total equity.

**Liquidity** - Ability of business to generate cash to make debt payments or to convert assets to cash.

**Machinery & Crop Expenses per Tillable Acre** - A measure of the cost to produce crops on a tillable acre basis. Add total crop expenses (DFBS p. 2) and total machinery expenses (p. 11), then divide by number of tillable acres, owned & rented (p. 11).

**Machinery & Crop Expense per Ton Dry Matter** - A measure of the cost per ton of DM to produce a crop. It is not a measure of total costs to produce feed. Add total crop expenses (DFBS p. 2) and total machinery expenses (p. 11), then divide by total forage, production, tons DM (p. 11).

**Milk Sold per Worker Equivalent for the Dairy Enterprise** – Determined by dividing the total amount of milk produced in the year by the number of worker equivalents in the dairy enterprise

**Milking System Only** – The milking center of dairy farms is a major investment and utilizes a significant portion of the farm labor. Producers provided estimates concerning the number of labor hours per day spent employed in the milking center and the number of milking units utilized. The labor represents time spent to set up, milk cows, and clean the milking center during a 24-hour period. Time spent to move cows to and from the milking center is not included.

**Net Farm Income** - (defined on page 14).

**Net Farm Income from Operations Ratio** - The percentage of each gross dollar that is generated that is net farm income. Net Farm Income without Appreciation (DFBS p. 4) divided by Total Accrual Receipts (p. 3) times 100.

**Net Farm Income without Appreciation per Cwt.** - The amount of net farm income, without appreciation, per cwt., that the farm generated. Divide net farm income without appreciation (DFBS p. 4) by number of cwt. of milk sold, which is total milk sold (p. 12) divided by 100.

**Net Farm Income without Appreciation per Cow** - The amount of net farm income, without appreciation, per cow that the farm generated. Divide net farm income without appreciation (DFBS p. 4) by average number of cows for the year (p. 12).

**Net Income Efficiency Ratio** - A measure of how efficiently the business is in generating net income, taking into account the differences in number of operators, debt levels, and amount of unpaid family labor being used on a farm. Net farm income without appreciation minus unpaid family labor charge (DFBS p. 4), plus Accrual Interest Paid (p. 3), divided by number of operators (p. 4), divided by Total Accrual Receipts (p. 3) times 100.

**Net Milk Income over Purchased Feed Costs per Cow** – A measure of the overall performance of the feeding program for the dairy. Gross milk sales per cow minus milk marketing expenses per cow minus purchased grain and concentrates per cow.

**Net Milk Receipts per Cwt.** - The mail box price received by farmers before any farmer authorized assignments or deductions. Accrual Receipts from milk, per cwt. (DFBS p. 12) minus accrual milk marketing expense per cwt. (p. 12).

**Net Worth** - The value of assets less liabilities equal net worth. It is the equity the owner has in owned assets.

**Operating Costs of Producing Milk** - (defined on page 29).

**Operating Expense Ratio** - The percentage of Total Accrual Receipts that is used for operating expenses, excluding interest & depreciation. Total Accrual Expenses (DFBS p. 3) minus Machinery Depreciation (p. 3), minus Building Depreciation (p. 3), minus Accrual Interest Expense (p. 3), divided by Total Accrual Receipts (p. 3) times 100.

**Opportunity Costs** - The cost or charge made for using a resource based on its value in its most likely alternative use. The opportunity cost of a farmer's labor and management is the value he/she would receive if employed in his/her most qualified alternative position.

**Other Livestock Expenses** - All other dairy herd and livestock expenses not included in more specific categories. Other livestock expenses include; bedding, milk house and parlor supplies, livestock board, registration fees and transfers.

**Percent Herd on bST** – Percent of maximum number of cow days per year that could be supplemented following label restrictions that were treated with bST.

**Personal Withdrawals and Family Expenditures Including Nonfarm Debt Payments** - All the money removed from the farm business for personal or nonfarm use including family living expenses, health and life insurance, income taxes, nonfarm debt payments, and investments.

**Personal Withdrawals & Family Expenditures per Cwt.** - The amount of money on a per cwt. basis that the family uses for family living and personal expenses. This is the total amount, per cwt., used by the family, including farm and nonfarm income. Personal withdrawals/family expense, including nonfarm debt payments (DFBS p. 9) divided by pounds milk sold (p. 12) divided by 100.

**Personal Withdrawals & Family Expenditures per Cow** - The amount of money on a per cow basis that the family used for family living and personal expenses. This is the total amount, per cow, used by the family, including farm and nonfarm income. Personal withdrawals/family expense, including nonfarm debt payments (DFBS p. 9) divided by average number of cows (p. 12).

**Pounds of Milk Harvested per Hour of Milking Labor** – Calculated by dividing the total pounds milk produced by the total number of labor hours used to operate the milking center for one year. The total number of labor hours is estimated by multiplying the number of hours to operate the milking center for one day, which was provided by the participating dairies, by 365. Operating the milking center includes setting up, milking, and washing down the milking center, but doesn't include time spent to bring cows to and from the milking center.

**Pounds of Milk Harvested per Machine Per Year** – Calculated by dividing the total pounds of milk produced for the year by the number of milking machines in the milking center.

**Profitability** - The return or net income the owner/manager receives for using one or more of his or her resources in the farm business. True "economic profit" is what remains after deducting all the costs including the opportunity costs of the owner/manager's labor, management, and equity capital.

**Purchased Inputs Cost of Producing Milk** - (defined on page 29).

**Repayment Analysis** - an evaluation of the business' ability to make planned debt payments.

**Replacement Livestock** - Dairy cattle and other livestock purchased to replace those that were culled or sold from the herd during the year.

**Return on Equity Capital** - (defined on page 16).

**Return on Total Capital** - (defined on page 16).

**Solvency** - The extent or ability of assets to cover or pay liabilities. Debt/asset and leverage ratios are common measure of solvency.

**Total Costs of Producing Milk** - (defined on page 29).

**Total Cows Milked Per Hour of Milking Labor Per Day** – Determined by dividing the average number of milking and dry cows by the labor hours required to operate the milking center for a one day period.

**Total Labor Costs per Worker Equivalent, All Labor** - The average cost per worker equivalent when considering all labor (hired, paid family, family non-paid, and operators) used on the farm and total costs for this labor. Total Labor Cost (p. 14) divided by number of worker equivalents (p. 14).

**Whole Farm Method** - A procedure used to calculate costs of producing milk on dairy farms without using enterprise cost accounts. All non-milk receipts are assigned a cost equal to their sale value and deducted from total farm expenses to determine the costs of producing milk.

**Worker Equivalents for the Dairy Enterprise** – Determined by the farmer estimating how many of hours of labor are spent in the milking center and dairy complex performing all routine tasks. Labor spent in the field or in the dairy replacement enterprise is excluded. The daily labor estimate is multiplied by 365 days and then divided by 2,760 hours to get the number of worker equivalents.

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## OTHER A.E.M. EXTENSION BULLETINS

EB No	Title	Fee (if applicable)	Author(s)
2017-04	Dairy Farm Business Summary, New York Large Herd Farms, 300 Cows or Larger, 2016	(\$20.00)	Karszes, J., Knoblauch, W.A. & Dymond, C.
2017-03	Workforce Issues and the New York Dairy Industry, Focus Group Report		Maloney, T.R. & Eiholzer, L.
2017-02	Economic Benefits and Risks for Harvest Platform Adoption for NY Fruit Farms		Ifft, J., Freedland, J., and Wells, M.
2017-01	A Practitioner's Guide to Conducting an Economic Impact Assessment of Regional Food Hubs using IMPLAN: A Systematic Approach		Schmit, T. and B. Jablonski
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