

# WISCONSIN DAIRY DATA

Fact sheet series from the Center for Dairy Profitability

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## Cost of Milk Production per Hundredweight Equivalent by Rate of Return on Asset (ROROA) Ranges by Gary Frank

ROROA on Wisconsin dairy farms ranges from a negative 20 percent to a positive 30 percent. What causes this difference? Is it farm size, pounds of milk sold per cow, assets per cow, debt per cow, or some combination of costs? To try to shed some light on these questions, the cost of milk production per hundredweight equivalent (CWT EQ) was calculated for farms that had ROROA percentage of: less than 0%, 0% to 5%, 5% to 10% and greater than 10%.

Table 1

	Rate of Return on Assets (ROROA)			
	Less than 0%	0% to 5%	5% to 10%	Greater than 10%
Number of Farms	109	193	204	105
Total Number of Dairy Cows	73	80	130	198
Pounds of Milk Sold per Cow	17,322	18,762	21,002	22,248
Milk Income per Cow	\$2,567	\$2,743	\$3,156	\$3,372
Assets per cow	\$9,621	\$8,750	\$8,557	\$6,545
Debt per cow	\$2,985	\$2,627	\$3,078	\$2,403

Table 2

Basic Cost				
	Less than 0%	0% to 5%	5% to 10%	Greater than 10%
Breeding Fees	0.18	0.18	0.18	0.18
Crop Protection Chemicals	0.24	0.23	0.21	0.14
Custom Hire (Machine Work)	0.57	0.47	0.35	0.43
Feed Purchase	2.86	2.47	2.77	3.00
Fertilizer and Lime	0.41	0.42	0.31	0.23
Freight and Trucking	0.19	0.18	0.24	0.13
Gasoline, Fuel, and Oil	0.43	0.36	0.30	0.23
Farm Insurance	0.25	0.22	0.16	0.13
Rent/Lease Equipment	0.18	0.11	0.13	0.13
Rent/Lease Other	0.75	0.56	0.51	0.52
Repairs & Maintenance	1.26	0.97	0.81	0.63
Seeds and Plants Purchased	0.43	0.37	0.30	0.23
Supplies Purchased	0.61	0.53	0.43	0.33
Taxes	0.28	0.24	0.17	0.13
Utilities	0.42	0.33	0.26	0.23
Veterinary Fees and Medicine	0.50	0.45	0.42	0.43
Other Livestock Expenses	0.37	0.42	0.59	0.72
Other Farm Expenses	0.61	0.54	0.41	0.43
- Change in Prepaid Expenses	0.01	(0.02)	(0.15)	(0.13)
Change in Accounts Payable	(0.05)	(0.00)	0.00	(0.02)
Depreciation on Purchased Breeding Livestock	0.89	0.48	0.36	0.33
<b>Total Basic Cost</b>	<b>11.37</b>	<b>9.49</b>	<b>8.75</b>	<b>8.52</b>

## Results

Table 1 shows the number of farms, total number of cows, milk sold per cow, milk income per cow, assets per cow and debt per cow in the various ROROA ranges. There are 109 farms with a negative ROROA and 105 farms with a ROROA of greater than 10 percent. There is a positive correlation between herd size, milk sold per cow, milk income per cow and ROROA. Also, there appears to be a negative correlation between assets per cow, debt per cow and ROROA. The highest ROROA farms (as a group) have only 68% as many assets per cow as the lowest ROROA farms. (Note: whenever the Return on Assets is identical, the farm with the smaller asset base will have the higher ROROA). The highest ROROA farms also have only 81% as much debt per cow as the lowest ROROA farms.

Table 2 shows that as ROROA increases the “Basic Cost” per CWT EQ decreases. The decrease in Basic Cost, from negative ROROA to greater than 10% ROROA, is \$2.83 per CWT EQ. The cost of all expense items except Purchased Feed and Other Livestock Expenses (mostly BST) decreases with the decrease per item usually less than \$0.25 per CWT EQ. Therefore, it would appear that across the board decreases in expenses are required to increase ROROA to greater than 10 percent.

**Table 3**

<b>Interest Cost</b>					
	<b>Mortgage Interest</b>	0.41	0.30	0.38	0.18
	<b>Other Interest</b>	0.66	0.66	0.47	0.65
	<b>Total Interest Cost</b>	<b>1.07</b>	<b>0.96</b>	<b>0.84</b>	<b>0.83</b>
<b>Labor Cost</b>					
	<b>Employee Benefits - Dependents</b>	0.23	0.25	0.19	0.10
	<b>Employee Benefits - Non-Dependents</b>	0.12	0.12	0.26	0.22
	<b>Labor Hired - Dependents</b>	0.34	0.41	0.30	0.21
	<b>Labor Hired - Non-Dependents</b>	0.66	0.66	1.10	1.14
	<b>Value of Unpaid Labor &amp; Management</b>	2.07	1.45	0.83	0.60
	<b>Total Labor Cost</b>	<b>3.42</b>	<b>2.89</b>	<b>2.69</b>	<b>2.26</b>
<b>Depreciation &amp; Equity Cost</b>					
	<b>Machinery, Equipment, Building Depreciation</b>	1.98	1.50	1.15	0.90
	<b>Interest on Equity Capital</b>	1.88	1.72	1.17	0.73
	<b>Total Depreciation &amp; Equity Cost</b>	<b>3.86</b>	<b>3.22</b>	<b>2.31</b>	<b>1.62</b>
	<b>Total Expenses</b>	<b>19.72</b>	<b>16.56</b>	<b>14.59</b>	<b>13.25</b>
	<b>Total Income - Total Expenses</b>	<b>(4.78)</b>	<b>(1.62)</b>	<b>0.35</b>	<b>1.69</b>

Table 3 shows that interest paid per CWT EQ decreases as ROROA increases; however the drop is less than \$0.25. Total Labor Costs, Machinery, Equipment, Building Depreciation and Interest on Equity Capital all decrease by more than \$1.00 as ROROA increases. Equity per cow falls 38%, but interest on equity capital per CWT EQ falls 60% as ROROA increases because milk sold per cow also increases. Total Income – Total Expenses (profit) increases \$6.47 per CWT EQ from the lowest ROROA range to the highest.

**Table 4**

<b>Net Farm Income from Operations (NFIFO) Summary</b>					
	Total Allocated Costs	15.76	13.39	12.60	11.93
	<b>Net Farm Income From Operations (NFIFO)</b>	<b>(0.82)</b>	<b>1.55</b>	<b>2.34</b>	<b>3.01</b>
	Gain (Loss) on Sale of All Farm Capital Assets	0.04	0.07	0.07	0.12
	<b>Net Farm Income (NFI)</b>	<b>(0.78)</b>	<b>1.62</b>	<b>2.42</b>	<b>3.13</b>

Table 4 tells a similar story. Through the various ROROA ranges, Net Farm Income per CWT EQ increases \$3.91. This is less than the \$6.47 shown above. What causes this difference? The answer lies in two items -- “Value of Unpaid Labor & Management” and “Interest on Equity Capital.” These two “expenses” are not included in the Net Farm Income calculation.

## Conclusion

Farms with higher ROROA have more cows per farm with more pounds of milk sold per cow. They have fewer assets per cow and lower debt per cow. In addition farms with higher ROROA have lowered the cost of producing a hundredweight equivalent (CWT EQ) of milk. The amount that costs decreases depends on which costs we are considering. If we are considering only Basic Costs, the cost decreases by \$2.83 per CWT EQ. If we are looking at all costs (including the opportunity cost of labor, management, and equity capital), the cost decreases by \$6.47 per CWT EQ. If we are looking at the return to the operator’s labor, management and equity capital (Net Farm Income), that return increases by \$3.91 per CWT EQ.