

MILK PRODUCTION COSTS in 2002 on Selected WISCONSIN DAIRY FARMS

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July 31, 2003

Introduction

The good news is that Wisconsin dairy farmers lowered the basic cost of production per hundredweight equivalent by over a dollar (\$1.12) when comparing 2002 to 2001 and lowered the total cost of production by \$1.77 per hundredweight equivalent. The basic cost per cow remained essentially the same. It was \$2,160 in 2001 and is \$2,143 in 2002. The bad news is the average U.S. milk price was almost \$3.00 (\$2.79) lower in 2002 than in it was in 2001.

In 2002, the U.S. Average Milk Price (\$12.15) was less than the study farms' total economic cost of milk production (\$13.30); creating a loss of \$1.15 per hundredweight equivalent of milk produced. In 2001, the economic production cost and the price were nearly identical. The loss was only \$0.13 per hundredweight equivalent of milk produced.

In 2000, there was a loss of \$0.87 per hundredweight equivalent of milk produced. These three years of losses follow two years in the U.S. Average Milk Price was greater than the total economic cost. In 1999 the U.S. Average Milk Price was just \$0.10 more than the costs. In 1998, the U.S. Average Milk Price exceeded total economic cost by \$0.53 per hundredweight equivalent.

In this study of 2002 records, 581 dairy farms (averaging 117 cows and 20,858 milk sold per cow) had a basic cost of \$7.91 per hundredweight equivalent (CWT EQ) on income of \$12.15 (U.S. average per hundredweight milk price in 2002). The total economic cost was \$13.30 per CWT EQ leading to a loss of \$1.15.

In the study of 2001 records, 627 dairy farms (averaging 106 cows and 20,454 milk sold per cow) had a basic cost of \$9.03 per hundredweight equivalent (CWT EQ) on income of \$14.94 (U.S. average per hundredweight milk price in 2001). There are now 708 Wisconsin dairy farms in our 2001-year records². With the addition of 81 more farms, the basic cost increased only \$0.06 per CWT EQ to \$9.09. The total economic cost of production for fiscal year 2001 was \$15.08 per hundredweight equivalent in the initial study subsequently with the addition of 81 farms the total cost is \$0.01 lower at \$15.07.³

In 2000, there were 605 dairy farms included in our cost of production study and the basic cost was \$7.75 per CWT EQ. There are now 743 Wisconsin dairy farms in our 2000-year records². With the addition of 138 more farms, the basic cost decreased only \$0.12 per CWT EQ to \$7.63. The total economic cost of production for

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² AgFA@ (Agriculture Financial Advisor) – <http://cdp.wisc.edu/agfa>

³ The Center for Dairy Profitability uses an active/real time database (AgFA@) for collecting and analyzing data. The number of records will likely increase throughout the course of the year.

fiscal year 2000 was \$13.20 per hundredweight equivalent in the initial study; subsequently, with the addition of 138 farms the total cost is \$0.24 lower at \$12.96.³

Data Source

Lakeshore Farm Management Association, Fox Valley Management Association, Wisconsin County Agents and Wisconsin Technical College System Instructors⁴ originally collected this data. Personnel affiliated with these associations helped individual farm managers reconcile their financial data. Individual farm managers used a number of different manual and computerized record keeping systems to enter the initial financial records, including the Agricultural Accounting and Information Management System (AAIMS©).

Results – Per Farm

Table 1 shows the average cost of production in 2002 using three different report bases. They are whole farm, per cow and per hundredweight equivalent (CWT EQ). The costs are broken into 4 different categories. They are: basic costs (similar to the Cost of Goods in non-farm accounting), interest costs, labor costs, and depreciation and equity costs.

Table 1 shows a basic cost of \$2,143 per cow and \$7.91 per CWT EQ. The total income per cow was \$3,291 in 2002.

Table 1 shows an economic loss averaging \$36,354 per dairy farm in 2001 or a loss of \$310 per cow. This means that either the farm manager's labor and management or the equity capital did not receive a market rate in 2002. The cost assigned to the farm manager's unpaid labor and management was \$29,937 and the opportunity cost of the farm manager's equity capital was \$33,390. These are non-cash costs; however the cash required for family living costs is not included in farm expenses.

Table 1 also shows the average costs per CWT EQ for selected expense categories that closely match the expense categories on the Schedule F Federal tax form. It also shows opportunity cost for unpaid labor and management, and interest on equity capital.

Table 1 shows the average per cow costs for all farms in the study. The purchased feed per cow remained steady in 2002. Purchased feed Costs per cow were \$638, \$649, \$518, \$581, \$663, \$657 and \$662 in 2002, 2001, 2000, 1999, 1998, 1997 and 1996 respectively). Supplies have remained fairly stable at \$101 per cow versus \$104 per cow in 2001 versus \$99 per cow in 2000.

Interest costs per cow in 2002 were somewhat lower than they have been in the last several years. They were \$188 in 2002, a drop of \$20 per cow, but not nearly as much as might have been expected given the falling interest rates. Interest paid per cow were \$208, \$207, \$197, \$226, \$218, \$212 and \$205 in 2001, 2000, 1999, 1998, 1997, 1996, and 1995, respectively.

Paid labor costs increased to \$411 per cow in 2002. This \$35 per cow increase is the largest increase since the 1995 to 1996 years. They were: \$376, (2001) \$344, (2000) \$366 (1999), \$353 (1998), \$323 (1997), \$300 (1996) and \$237 (1995). Paid labor costs have been steadily increasing over the year. Some of this change is due to larger farms with a higher percentage of paid labor and some of it is due to more dairy farm manager paying their spouse and children.

⁴ The authors wish to thank members of the Lakeshore Farm Management Association, Fox Valley Farm Management Association and various county agents and WTCS instructors for their cooperation.

Look at Table 1 to see if your costs are competitive. You can use “per Cow” or the “per CWT EQ” column on Table 1 to help you identify categories of your expenses that are above average.⁶ For instance, suppose your fuel and oil costs are \$110 per cow, is this okay? How do you know? Use the “per Cow” column on Table 1 or select the herd size similar to your herd size from Table 4 to help you make that judgment. If your farm’s cost is NOT at or below the average you should find out why this is occurring and do what you can to decrease the costs in that category.

Table 1 – Cost of Production in 2002

Report Basis: Whole Farm, per Head, per Hundredweight Equivalent				
Income		2002	2002	2002
		Economic	per Head	per CWT
	Total Income	385,526	3,290.78	12.15
Expenses				
Basic Cost	Cost of Items for Resale	170	1.45	0.01
	Breeding Fees	4,999	42.67	0.16
	Car and Truck Expenses	1,746	14.91	0.06
	Chemicals	5,313	45.35	0.17
	Conservation Expenses	0	0.00	0.00
	Custom Heifer Raising Expenses	1,015	8.66	0.03
	Custom Hire (Machine Work)	12,870	109.85	0.41
	Feed Purchase	74,721	637.81	2.35
	Fertilizer and Lime	7,371	62.91	0.23
	Freight and Trucking	4,227	36.08	0.13
	Gasoline, Fuel, and Oil	7,374	62.94	0.23
	Farm Insurance	5,094	43.48	0.16
	Rent/Lease Equipment	2,556	21.82	0.08
	Rent/Lease Other	15,540	132.65	0.49
	Repairs and Maintenance	1,983	16.93	0.06
	Building and Fence Repairs	5,123	43.73	0.16
	Machinery Repairs	12,624	107.76	0.40
	Seeds and Plants Purchased	7,273	62.08	0.23
	Storage and Warehousing	16	0.13	0.00
	Supplies Purchased	11,813	100.83	0.37
	Taxes - Other	4,499	38.41	0.14
	Taxes - Payroll	51	0.44	0.00
	Utilities	8,562	73.08	0.27
	Veterinary Fees and Medicine	12,703	108.43	0.40
	Other Farm Expenses	4,109	35.08	0.13
	Marketing & Hedging	4,217	36.00	0.13
	Other Crop Expenses	2,343	20.00	0.07
	Other Livestock Expenses	15,641	133.51	0.49
	- Change in Prepaid Expenses	4,636	39.57	0.15
	Change in Accounts Payable	3,135	26.76	0.10
	Depreciation Purchd Breeding Livestock	9,327	79.61	0.29
	Total Basic Cost	251,050	2,142.92	7.91

⁵ Frank, Gary G. “Calculating Your Milk Production Costs and Using the Results to Manage Your Expenses”, August 1996. Available on the Center for Dairy Profitability website: <http://cdp.wisc.edu>

Table 1 – Cost of Production in 2002 (cont)

Interest Cost				
	Mortgage Interest	8,603	73.43	0.27
	Other Interest	13,385	114.25	0.42
	Total Interest Cost	21,988	187.68	0.69
Labor Cost				
	Employee Benefits - Dependents	5,070	43.28	0.16
	Employee Benefits - Non-Dependents	5,518	47.10	0.17
	Labor Hired - Dependents	7,744	66.11	0.24
	Labor Hired - Non-Dependents	29,857	254.85	0.94
	Value of Unpaid Labor & Management	29,937	255.54	0.94
	Total Labor Cost	78,127	666.88	2.46
Depreciation & Equity Cost				
	Machinery, Equipment, Building	37,335	318.68	1.18
	Interest on Equity Capital	33,390	285.01	1.05
	Total Depreciation & Equity Cost	70,724	603.69	2.23
	Total Expenses	421,889	3,601.17	13.30
	Total Income - Total Expenses	(36,364)	(310.39)	(1.15)

Table 2 shows the average Net Farm Income in 2002 was \$257 per cow. It was \$544 in 2001. You may wonder how a farm can be economically unprofitable and have a positive net farm income. The answer lies in the definition of net farm income. Net Farm Income is total farm income minus all farm expenses except Value of Unpaid Labor and Management and Interest on Equity Capital. Net Farm Income is sometime referred to as the farm manager's wage, but this is not totally true. Net Farm Income is the return to the farm manager's (and all other) unpaid labor and management plus the return to equity capital.

**Table 2
Net Farm Income in 2002**

	per Farm	per Head	per CWT
Total Allocated Costs	358,562	3060.62	11.30
Net Farm Income From Operations (NFIFO)	26,963	230.15	0.85
Gain (Loss) on Sale of All Farm Capital Assets	3,101	26.47	0.10
Net Farm Income (NFI)	30,064.65	256.63	0.95

Net Farm Income is sometimes used as a proxy for the dollars the farm manager has available to pay family living expenses and income and social security taxes. This is fine as a proxy, but is not very accurate because some of the incomes and expenses used to calculate net farm income are non-cash (like depreciation). Also some wages and benefits deducted as a business expense are paid to family members. In addition, farm managers have other demands on the cash the farm operation generates such as debt repayment and down payments on new capital purchases, so the money available for family living usually does not equal Net Farm Income.

Table 3
Milk Production Costs per Farm in 2002

Range in Herd Size	<=50 Cows	51 to 75	76 to 100	101 to 150	151 to 250	> 250 Cows
Number of Farms	138	180	89	74	43	57
Average Cows per Farm	42	63	88	122	192	454
Milk Sold per Cow (lbs)	17,973	19,490	20,013	20,242	21,382	22,403
Crop Acres per Cow	4.9	5.1	4.8	4.6	3.1	2.3
Total Crop Acres Farmed	206	321	422	561	595	1044
Cost of Items for Resale	2	224	32	631	0	157
Breeding Fees	1877	2954	3889	5126	7855	18424
Car and Truck Expenses	1397	1378	1673	1680	1938	3812
Chemicals	2098	3425	4786	6534	7633	16549
Custom Heifer Raising Expenses	19	72	628	563	2552	6432
Custom Hire (Machine Work)	2599	5881	9971	12614	21755	57962
Feed Purchased	19971	32503	46101	69577	127955	351804
Fertilizer and Lime	3100	5531	7876	11533	9583	15655
Freight and Trucking	1461	2147	2811	4612	6520	17473
Gasoline, Fuel, and Oil	3127	4254	6371	8824	10724	24662
Farm Insurance	2680	3528	4584	5582	7854	13963
Rent/Lease Equipment	455	745	1789	3454	7914	9349
Rent/Lease Other	3641	8082	12038	19719	23780	61731
Repairs and Maintenance	750	1428	3375	955	4961	3635
Building and Fence Repairs	2269	3103	4041	6149	7729	16802
Machinery Repairs	5102	8082	10634	16670	17851	39092
Seeds and Plants Purchased	3001	5320	7687	8022	11579	18919
Supplies Purchased	5367	7779	10537	14248	16124	35733
Taxes - Other	2672	3247	4340	5261	7144	10668
Utilities	3801	5476	7485	9709	13595	26231
Veterinary Fees and Medicine	5892	6382	9211	11708	21081	54508
Other Farm Expenses	1923	6398	10710	16597	40683	126557
Marketing & Hedging	1377	2099	3007	4410	6859	17427
- Change in Prepaid Expenses	1432	559	3484	5798	6495	24155
Change in Accounts Payable	-88	569	1326	2402	1479	24064
Depr on Purchased Livestock	1875	2752	6032	7319	24182	44673
Basic Costs	77,801	123,914	184,416	259,697	415,825	1,040,438
Mortgage Interest	2505	3867	5845	8233	19260	35067
Other Interest	4065	6316	9683	12821	20704	59265
Labor Hired (Dependents)	4229	7774	8861	7703	17431	7167
Labor Hired (Non-dep)	1364	5261	10978	29023	49756	192055
SST & Emp Bens (Dep)	3979	5552	5301	5827	5793	4300
SST & Emp Bens (Non-dep)	323	1205	2167	5655	8753	34332
Dpr - Mach, equip, build	14673	27707	32688	39015	55125	114256
Total Allocated Costs	108941	181596	259938	367974	592647	1486880
Total Farm Incomes	125,031	197,392	286,500	405,791	640,190	1,546,496
NFIFO*	16,091	15,796	26,562	37,817	47,543	59,616
Gain (loss) on sale of all Farm Capital Assets	627	4270	6067	1646	1216	4158
NFI	16,718	19,834	32,630	39,463	48,758	63,825
NFI + Dependents Labor and Benefits	24,926	33,160	46,792	52,993	71,982	75,291

*Net Farm Income from Operations

You should be very careful when comparing your farm to Table 3. Even though the table is broken into different herd size categories the herd size range in each category is wide. NOTE: Tables 4 and 5 can be used without this caution because they are generated after standardizing the data per cow or CWT EQ.

Table 3 shows the per farm cost of production averages in six herd size categories. To assist in your understanding of the entire table, the “Range in Herd Size – 101 to 150” column is used as an example.

There were 74 herds in the data set that had more than 100 cows and less than 151 cows. Those herds averaged 122 cows and sold on average of 12,242 pounds of milk per cow. They had an average of 4.6 crop acres per cow and farmed 561 acres of cropland.

The average amount of purchased feed was \$69,577 per farm. In addition, they paid \$6,534 for crop chemicals, \$11,533 for fertilizer, \$23,773 for repairs, and \$11,708 for vet & medicine. These are nearly identical to the costs in 2001. *Then purchased feed was \$69,364 per farm, \$6,240 for crop chemicals, \$10,640 for fertilizer, \$27,369 for repairs, and \$10,928 for vet & medicine.*

In 2002, there was a decrease in prepaid expenses of \$5,798 and an increase in accounts payable of \$2,402. This totals \$8,200 in per farm costs that were paid out of cash in a previous year or will have to be paid out of cash in a future year.

Total Basic Costs, for the 101 to 150 herd size farms was \$259,697 in 2002; it was \$253,450 per farm in 2001 and \$232,125 per farm in 2000.

In addition to Basic Costs, this group of farms had \$36,726 in paid labor costs (\$7,703 to dependents and \$29,023 to non-dependents). This is approximately \$1,500 more than in 2001 and less was paid to dependents (\$400). Therefore non-dependents received \$1,900 more in 2002.

Social Security Taxes plus Benefits equaled \$11,482 (\$5,827 to dependents and 5,655 to non-dependents) in 2002 versus \$9,539 in 2001. As with non-agriculture employers, the benefits portion of an agricultural employee’s package is increasing rapidly. In our sample it increased 20 percent from 2001 to 2002. There was also \$21,054 (8,233 plus 12,821) of interest expense. This is a decrease of approximately \$1,400 from 2001. In 2002, \$46,334 of depreciation was claimed. Some of that depreciation (\$7,319) was on taken on purchased livestock.

The Total Allocated Costs are \$367,974 in 2002 versus \$354,575 per farm in 2001 and \$327,453 per farm in 2000. The Total Income per farm was \$405,791, \$414,922 and \$375,163 in 2002, 2001, and 2000, respectively. The Net Farm Income from Operations (NFIFO) in 2002 was \$37,817 versus \$60,347 and \$47,710 in 2001 and 2000. The total return to the owner-operator-manager’s (and family’s) labor, management and equity capital is the last line in Table 3. It has the amount paid to dependents added to the NFI.

When comparing NFIFO in 2002 to those in 2001, all farm size categories had a decrease. Most were in the 20 to 25 percent range. However the largest farms, those with herd sizes in excess of 250 cows, had a decrease in NFIFO of over 70 percent or in absolute terms almost \$150,000.

Table 4
Milk Production Costs per Cow in 2002

Range in Herd Size	≤50 Cows	51 to 75	76 to 100	101 to 150	151 to 250	> 250 Cows
Number of Farms	138	180	89	74	43	57
Total Number of Cows	5,796	11,340	7,832	9,028	8,256	25,878
Average Cows per Farm	42	63	88	122	192	454
Milk Sold per Cow (lbs)	17,973	19,490	20,013	20,242	21,382	22,403
Dairy Livestock Sales Per Cow	228.0	248.0	219.0	195.0	164.0	167.0
Crop Acres per Cow	4.9	5.1	4.8	4.6	3.1	2.3
Cost of Items for Resale	0.04	3.57	0.36	5.18	0.00	0.35
Breeding Fees	44.61	47.17	44.40	42.02	40.90	40.54
Car and Truck Expenses	33.21	21.99	19.10	13.77	10.09	8.39
Chemicals	49.86	54.68	54.64	53.56	39.75	36.41
Custom Heifer Raising Expenses	0.46	1.14	7.17	4.61	13.29	14.15
Custom Hire (Machine Work)	61.77	93.90	113.84	103.40	113.29	127.53
Feed Purchased	474.67	518.92	526.31	570.36	666.34	774.07
Fertilizer and Lime	73.69	88.31	89.91	94.54	49.90	34.45
Freight and Trucking	34.73	34.28	32.09	37.81	33.95	38.45
Gasoline, Fuel, and Oil	74.33	67.91	72.73	72.33	55.85	54.26
Farm Insurance	63.70	56.32	52.33	45.76	40.90	30.72
Rent/Lease Equipment	10.81	11.89	20.43	28.32	41.21	20.57
Rent/Lease Other	86.53	129.04	137.43	161.64	123.83	135.83
Repairs and Maintenance	17.84	22.80	38.53	7.83	25.83	8.00
Building and Fence Repairs	53.94	49.54	46.13	50.40	40.25	36.97
Machinery Repairs	121.27	129.03	121.40	136.65	92.96	86.01
Seeds and Plants Purchased	71.34	84.93	87.76	65.76	60.30	41.63
Supplies Purchased	127.56	124.20	120.30	116.79	83.97	78.62
Taxes - Other	63.36	51.78	49.55	43.13	36.62	22.56
Utilities	90.34	87.43	85.45	79.59	70.80	57.72
Veterinary Fees and Medicine	91.66	101.89	105.15	95.98	109.78	119.93
Other Farm Expenses	94.22	109.72	122.34	136.05	212.45	279.37
Marketing & Hedging	32.74	33.51	34.33	36.15	35.72	38.35
- Change in Prepaid Expenses	34.05	8.92	39.77	47.53	33.82	53.15
Change in Accounts Payable	(2.09)	9.08	15.13	19.69	7.70	52.95
Depr on Purchased Livestock	44.57	43.93	68.87	60.00	125.93	98.29
Basic Costs	1,849	1,986	2,105	2,129	2,165	2,289
Mortgage Interest	59.55	61.73	66.73	67.49	100.30	77.16
Other Interest	96.63	100.83	110.54	105.10	107.82	130.40
Labor Hired (Dependents)	100.51	124.11	101.16	63.15	90.77	15.77
Labor Hired (Non-dep)	32.41	84.00	125.33	237.92	259.11	422.58
SST & Emp Bens (Dep)	94.58	88.65	60.52	47.77	30.17	9.46
SST & Emp Bens (Non-dep)	7.69	19.24	24.73	46.36	45.58	75.54
Dpr - Mach, equip, build	348.76	442.36	373.18	319.82	287.07	251.40
Total Allocated Costs	2,589.33	2,906.78	2,967.65	3,016.44	3,086.26	3,271.56
Total Farm Incomes	2,971.79	3,151.46	3,270.84	3,326.45	3,333.84	3,402.74
NFIFO*	382.46	244.68	303.19	310.01	247.58	131.17
Gain (loss) on sale of all Farm Capital Assets	14.90	68.17	69.26	13.49	6.35	9.15
NFI	397.36	316.64	372.52	323.50	254.00	140.43

*Net Farm Income from Operations

Results – Per Cow

Table 4 is divided into six herd size categories for 2002 and shows per cow averages. The 57 farms in the “>250 cows” category have more than twice as many total cows than the 78 farms in the “101 to 150” category. Also, the 57 farms in the “>250 cows” category have almost five times as many total cows as the 138 farms in the “≤50 cows” category.

Table 4 shows that the larger farms (based on cow numbers) have fewer crop acres and lower property taxes (Taxes – other) per cow. However, larger farms have higher purchased feed costs per cow (\$774 versus \$475 for the smallest size category). Larger farms also have much higher “Other Expenses” per cow, \$279 versus \$94. “Other Expenses” includes a “miscellaneous livestock expense” category that accounts for about \$226 of this cost (versus \$24 on the smallest farms). This could be related to BST use as other data has suggested that larger farms use BST on a higher percentage of their herd.

The smallest herd size category was the only herd size category that did not show an increase in accounts payable in 2002. The largest herd size category had an account payable increase of \$53 per cow. This coupled with a decrease in prepaid expenses of \$53 leads to a \$106 per cow shift of the “cash outflow” to other years. If you have 1,000 cows, that is not just peanuts.

Basic Costs in the largest herd size category exceeded the Basic Costs in the smallest category by \$440 per cow (\$2,289 versus \$1,849). This amount appeared to be narrowing in 2000 as the difference had fallen to only \$335 per cow, but it widened again in 2001 and 2002. This difference is largely due to purchased feed cost, miscellaneous livestock expenses and livestock depreciation. As you move from the smallest herd-size category to the largest, livestock depreciation per cow more than doubles (\$45 to \$98). Notice also that the interest paid per cow increases slightly in the larger herd sizes.

The paid labor costs per cow increases from \$316 (124 + 84 + 89 + 19) in the “51 to 75” category to \$525 (16 + 422 + 9 + 76) in the “>250 cows” category. (In 2001 the values were \$300 and \$472, for those two herd size categories respectively.)

Total Allocated Costs per cow are \$365 (3,272 minus 2907) higher in largest farm size category than in the “51 to 75” size category. Again this gap appeared to be narrowing in 2000, but has returned to the pre-2000 level in 2001. Larger farms generate more than \$250 additional income per cow and they have lower per cow unpaid labor (family living) draws (\$136 versus \$369).

Cost of Production per Unit Calculation Method Used

There are three commonly used methods to calculate the cost of production per unit. They are “Cost per Unit of Primary Product Sold,” “Cost per Unit of Equivalent Production,” and “Residual Cost per Unit of Primary Product Sold.” All three of these methods will yield the same answer if the production process has just a single product. However, if the production process has joint products the results can be quite different. Dairy farms producing milk have numerous joint products: cull cows, calves, CCC milk assessment refund, cooperative dividends, property tax credit on income taxes, crop-related government payments, etc. *Therefore, knowing the cost of production per unit calculation method used in a study is essential.*

Each method of calculating the cost of production per unit has some advantages and disadvantages.⁷ This study uses the “Cost per Unit of Equivalent Production” method to calculate the cost of producing milk. *It was chosen because in using this method, the cost of milk production can be compared directly to the price of milk.* This method also permits the calculation of cost per hundredweight equivalent on individual expense items.

⁷ Frank, Gary G. “Cost of Production versus Cost of Production, July 1998. Available on the UW-Center for Dairy Profitability website at: <http://cdp.wisc.edu>

Results – Per CWT EQ

Table 5 shows the cost of milk per CWT EQ for six herd size ranges. Purchased feed costs increase by \$0.82 (\$1.94 versus \$2.76) per CWT EQ as herd sizes increase from the smallest to the largest. This is offset by a decrease in Fertilizer & Lime (-\$0.18), Gasoline, Fuel and Oil (-\$0.11), Machinery Repairs (-\$0.19), and Plants and Seed Purchased (-\$0.14).

Vet. & Medicine costs are approximately 16 percent higher per CWT EQ in herds over 250 cows versus herds of 76 to 100 cows. Other Expenses increase by \$0.51 per CWT EQ from the smallest to the largest herd size groups. It is presumed this is the cost of BST.

The “<50 cow” farms have the lowest Basic Costs per CWT EQ (\$7.57). The range in per CWT EQ costs among farm size groups is \$0.61 versus \$0.71 in 2001 and \$0.82 in 2000. Livestock depreciation is only \$0.18 per CWT EQ in the smallest herd size group but \$0.46 and \$0.35 per CWT EQ in the two largest herd-size categories.

Paid labor costs per CWT EQ range from \$0.96 to \$1.87 as you move from the smallest to the largest herd-size group. Labor cost paid to non-dependents per CWT EQ range from \$0.16 to \$1.78, showing that most of the paid labor on small farms is to dependents (family members).

The “<=50 cow” farms had the highest NFIFO per CWT in 2002 at \$1.56. In 2001, the “51 to 75 cow” farms were in first place at \$2.61. The “76 to 100 cow” and “101 to 150 cow” farms tied for second place and the “51 to 75 cow” and “151 to 250 cow” farms came in tied for at \$0.91. The largest herd size had the lowest NFIFO per CWT EQ at \$0.47. However, when the amount paid to family members is added back in and multiplied by the number of CWT EQ per farm, the return to the owner-operator-managers tell a different story. The larger herds have an average of \$75,291 for family living and a return to equity capital versus \$33,160 for the farms in the “51 to 75 cow” category and only \$24,926 for those in the fewer than 50 cow herd-size category. Note: this was stated earlier but because of its importance is stated again.

Table 5
Milk Production Cost per CWT EQ in 2002

Range in Herd Size	<=50 Cows	51 to 75	76 to 100	101 to 150	151 to 250	> 250 Cows
Number of Farms	138	180	89	74	43	57
Total Number of Cows	5,796	11,340	7,832	9,028	8,256	25,878
Average Cows per Farm	42	63	88	122	192	454
Milk Sold per Cow (lbs)	17,973	19,490	20,013	20,242	21,382	22,403
Crop Acres per Cow	4.9	5.1	4.8	4.6	3.1	2.3
Cost of Items for Resale	0.00	0.01	0.00	0.02	0.00	0.00
Breeding Fees	0.18	0.18	0.16	0.15	0.15	0.14
Car and Truck Expenses	0.14	0.08	0.07	0.05	0.04	0.03
Chemicals	0.20	0.21	0.20	0.20	0.14	0.13
Custom Heifer Raising Expenses	0.00	0.00	0.03	0.02	0.05	0.05
Custom Hire (Machine Work)	0.25	0.36	0.42	0.38	0.41	0.46
Feed Purchased	1.94	2.00	1.96	2.08	2.43	2.76
Fertilizer and Lime	0.30	0.34	0.33	0.35	0.18	0.12
Freight and Trucking	0.14	0.13	0.12	0.14	0.12	0.14
Gasoline, Fuel, and Oil	0.30	0.26	0.27	0.26	0.20	0.19
Farm Insurance	0.26	0.22	0.19	0.17	0.15	0.11
Rent/Lease Equipment	0.04	0.05	0.08	0.10	0.15	0.07
Rent/Lease Other	0.35	0.50	0.51	0.59	0.45	0.48
Repairs and Maintenance	0.07	0.09	0.14	0.03	0.09	0.03
Building and Fence Repairs	0.22	0.19	0.17	0.18	0.15	0.13
Machinery Repairs	0.50	0.50	0.45	0.50	0.34	0.31
Seeds and Plants Purchased	0.29	0.33	0.33	0.24	0.22	0.15
Supplies Purchased	0.52	0.48	0.45	0.43	0.31	0.28
Taxes - Other	0.26	0.20	0.18	0.16	0.13	0.08
Utilities	0.37	0.34	0.32	0.29	0.26	0.21
Veterinary Fees and Medicine	0.37	0.39	0.39	0.35	0.40	0.43
Other Farm Expenses	0.39	0.46	0.45	0.50	0.77	1.00
Marketing & Hedging	0.13	0.13	0.13	0.13	0.13	0.14
- Change in Prepaid Expenses	0.14	0.03	0.15	0.17	0.12	0.19
Change in Accounts Payable	(0.01)	0.04	0.06	0.07	0.03	0.19
Depr on Purchased Livestock	0.18	0.17	0.26	0.22	0.46	0.35
Basic Costs	7.57	7.69	7.82	7.78	7.89	8.18
Mortgage Interest	0.24	0.24	0.25	0.25	0.37	0.28
Other Interest	0.40	0.39	0.41	0.38	0.39	0.47
Labor Hired (Dependents)	0.41	0.48	0.38	0.23	0.33	0.06
Labor Hired (Non-dep)	0.13	0.32	0.47	0.87	0.94	1.51
SST & Emp Bens (Dep)	0.39	0.34	0.22	0.17	0.11	0.03
SST & Emp Bens (Non-dep)	0.03	0.07	0.09	0.17	0.17	0.27
Dpr - Mach, equip, build	1.43	1.71	1.39	1.17	1.05	0.90
Total Allocated Costs	10.59	11.24	11.02	11.02	11.24	11.68
Total Farm Incomes	12.15	12.15	12.15	12.15	12.15	12.15
NFIFO*	1.56	0.91	1.13	1.13	0.91	0.47
Gain (loss) on sale of all Farm Capital Assets	0.06	0.26	0.26	0.05	0.02	0.03
NFI	1.62	1.22	1.38	1.18	0.93	0.50

*Net Farm Income from Operations

Basic Cost of Production per Hundredweight Equivalent

"Total Allocated Expenses" are Total Expenses minus value of unpaid labor and management and minus a return to equity. "Basic Costs" are Total Allocated Expenses minus interest paid, all wages and benefits paid, and non-livestock depreciation expenses. Basic Cost is a useful measure when comparing one farm to another, because it is not influenced by the milk's composition, price premiums, farm's debt structure, and the amount of paid versus unpaid labor or the capital consumption claimed (depreciation).

An average Basic Cost of \$7.91 in 2002 per CWT EQ was calculated by summing the total basic costs on all farms and dividing by the total number of CWT EQ produced. 59 percent of farms had a basic cost of \$8.00 per CWT EQ or less, - an increase from the 30 percent who had Basic Costs of \$8.00 or less in 2001. This is consistent with 2000-65% and 1999-63%. In Table 6 selected ranges of basic costs are presented. It shows the number and percent of farms in each range.

The \$7.91 average basic cost means that the average farmer in this study had \$4.24 (The US average milk price in 2002 of \$12.15 minus basic expenses of \$7.91 per CWT EQ.) of income available per CWT EQ to use for other costs; versus \$5.91 in 2001.. Other costs are items such as hired labor, scheduled principal and interest payments, a down payment when purchasing assets, and/or a family living draw.

**Table 6
Number of Herds in Basic Cost Production Ranges in 2002**

Expenses per CWT EQ	Number of Farms	Percent of Farms *
Less than 6.00	61	11
6.01 - 7.00	128	22
7.01 - 8.00	148	26
8.01 - 9.00	128	22
9.01 - 10.00	62	11
10.01 - 11.00	29	5
Greater than 11.00	22	4

* Percent column may not add to 100 due to rounding.

Summary

The average herd size in our study group of farms was 117 cows. The milk sold per cow averaged 20,870 pounds. The average herd size in 2001 was 106 and the average milk sold per cow was 20,454.

Total economic cost of production per hundredweight equivalent of milk was \$1.15 less than the US average milk price in 2002 i.e Wisconsin dairy farmer had an economic loss of \$1.15 for each CWT EQ they produced in 2002 (in 2001 the total economic cost of production was only \$0.13 less than the US average milk price). Since our study of milk production costs began in 1992, in only two years (1998 and 1999) did the milk price exceed total economic costs.

Purchased feed costs still remain the largest cost item. Having declined in 2000 and 1999 after several years of being almost constant they increased to pre-1999 levels in 2002. Purchased feed costs per cow were \$637, \$649, \$518, \$581, \$663 in 2002, 2001, 2000, 1999 and 1998 respectively. Purchased feed costs per CWT EQ were \$2.35, \$2.71, \$2.11, \$2.30 and \$2.77 in 2001, 2000, 1999, and 1998 respectively.

The wages paid to dependent family members was \$79, \$113, \$118 \$125, \$112 per cow in 1996, 1997 and 1998, 1999, 2000 respectively and rose to \$129 per cow in 2001. In 2002 this figure decreased by \$20.00 in 2002 (\$109)

Total allocated expenses per cow in 2002 averaged \$3061 that is just a slight increase from 2001 (\$3,053), it was \$2,735 in 2000. The return to the farmer's (and family's) unpaid labor, management, and equity capital (Net Farm Income from Operations (NFIFO)) was \$230 per cow in 2002. This is considerably less than in 2001, 1999 and 1998 (\$520, \$657, and \$716) but only \$66 less than in 2000. (\$296).

In 2002 the average ROROA for the study farms was 2.17% that is a decrease from 5.57% in 2001 and 4.24% in 2000. This is the lowest ROROA in several years, reflecting the low milk prices. For more details on the financial status of these 581 study farms refer to "2002 Financial Benchmarks on Selected Wisconsin Dairy Farms" (July 2003); this paper benchmarks the 16 Farm Financial Standard Task Council measures plus a few others.