MILK PRODUCTION COSTS in 2009
on Selected
WISONSIN DAIRY FARMS

By Ken Bolton and Jenny Vanderlin[1]

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Introduction

The good news is that Wisconsin dairy farmers lowered their basic cost of production in 2009 by $1.97/cwt equivalent (CWT EQ) and by $247/cow when compared to 2008. The bad news is that the US All Milk Price at $12.83 was less than the average study farm's total economic cost of production of $14.97; creating a loss of $2.14/cwt.

To no one's surprise, 2009 was not a good financial year for dairy farmers. The U.S. All Milk Price was only $12.83 per hundredweight in 2009; the 6th lowest in the last 20 years. It was $18.33 in 2008 and $19.13 in 2007. Where it was not the only cause, this 30+ percent decline in milk price was the main cause for dairy farmers' financial problems. This continues the milk price volatility of recent years, especially since 1995.

Net Farm Income is total Economic farm income minus all farm expenses except the Value of Unpaid Labor and Management and, Interest on Equity Capital. After the charge for Unpaid Labor/Management and for Equity Capital is deducted from 2009 Net Farm Income, the total Economic Return per CWT. EQ. of -$2.11 results (-$0.34 - $0.95 - $0.82).

In 2009 Net Farm Income (NFI) was a negative $0.34 per CWT EQ largely because total farm income was only $12.76 per CWT EQ. The NFI per CWT EQ was positive in both 2008 and 2007 at $2.89 and $3.75, respectively. NFI was a negative $1.22 per CWT EQ in 2006 after being a positive $2.55 per CWT EQ in 2005. This fluctuation in NFI from year to year is largely due to the fluctuation in the milk price.

In this summary of 2009 financial records, 483 dairy farms averaging 176 cows and 22,847 lbs of milk sold per cow had a Basic Cost of production of $9.62/CWT EQ on income of $12.83 (U.S. average per hundredweight milk price in 2009). During 2008, 515 dairy farms averaging 158 cows and producing 22,212 lbs of milk sold per cow had a Basic Cost of $11.59 per CWT EQ on income of $18.36 (US average per cwt milk price in 2008). The total economic cost for fiscal year 2008 was $17.66 per CWT EQ. In 2007, 544 farms milking an average of 148 cows producing 21,958 lbs milk/cow produced a Basic Cost of production of $11.24/CWT EQ as compared to an All Milk Price of $19.13 and a total income/CWT EQ of $19.15. The total economic cost of production for 2007 was $17.73/CWT EQ.

Total farm numbers in the AgFA[2] data set summarized have declined each of the last four years from 677 farms in 2005, 592 in 2006, 579 in 2007, 546 farms in 2008 to 483 summarized in 2009.

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[1] Center for dairy Profitability, University of Wisconsin-Madison/Extension. Authors wish to think Dr. Gary Frank for his review and editorial comments.

Data Source

Lakeshore Farm Management Association, Fox Valley Management Association, independent consultants, UW-Extension Agricultural Agents and Wisconsin Technical College System Instructors[3] 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 AAIMS©[4] and QuickBooks©. The Agricultural Financial Advisor (AgFA) data set was used for this study. AgFA, a real time database, is a sample of Wisconsin dairy farms from which financial and production data are collected annually.

Cost of Production

Using Table 1 you can compare your cost of production and net farm income in 2009 using three different report basis: whole farm, per cow, and per hundredweight equivalent. The "per head" or the "per CWT EQ" column will help to identify categories of your expenses that are above average. For instance, suppose your fuel and oil costs are $110 per cow. Compare your farm's cost to the same item in Table 1. Is your cost competitive with your data base peers? If your farm's cost is NOT at or below the average you should find out why this has occurred and do what you can to decrease the costs and/or increase production efficiency in that category.

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[2] AgFA@ (Agricultural Financial Advisor) – http://cdp.wisc.edu. AgFA@ is an interactive/real time database for collecting and analyzing data.

[3] Authors with to thank members of the farm associations, consultants, UW-Extension, and WTCS instructors.

4 Agricultural Accounting and Information System (AAIMS)

Table 1
Cost of Production, 2009
Report Basis: Whole farm, per Head, Per Hundredweight Equivalent

Income		2009 Economic	2009 per Head	2009 per CWT EQ
	Animal Product Sales	537,373.82	3,051.11	9.83
	Raised Non-Breeding Livestock Sales	10,352.20	58.78	0.19
	Crop Sales	39,260.25	222.91	0.72
	Sale of Raised Breeding Livestock	24,749.22	140.52	0.45
	Other Income	85,786.50	487.08	1.57
	Total Income	**697,521.99**	**3,960.40**	**12.76**

Expenses		2009 Economic	2009 per Head	2009 per CWT EQ
Basic Cost				
	Cost of Items for Resale	131.31	0.75	0.00
	Breeding Fees	9,745.50	55.33	0.18
	Car and Truck Expenses	2,552.07	14.49	0.05
	Crop Chemicals	8,451.81	47.99	0.15
	Conservation Expenses	11.71	0.07	0.00
	Custom Heifer Raising Expenses	6,343.89	36.02	0.12
	Custom Hire (Machine Work)	23,689.23	134.50	0.43
	Feed Purchase	182,642.40	1,037.01	3.34
	Fertilizer and Lime	17,794.18	101.03	0.33
	Freight and Trucking	8,451.64	47.99	0.15
	Gasoline, Fuel, and Oil	20,957.81	118.99	0.38
	Farm Insurance	9,006.23	51.14	0.16
	Rent/Lease Equipment	2,885.69	16.38	0.05
	Rent/Lease Other	24,825.73	140.96	0.45
	Repairs and Maintenance	2,582.27	14.66	0.05
	Building and Fence Repairs	7,495.78	42.56	0.14
	Machinery Repairs	21,499.37	122.07	0.39
	Seeds and Plants Purchased	15,298.15	86.86	0.28
	Storage and Warehousing	41.46	0.24	0.00
	Supplies Purchased	18,134.29	102.96	0.33
	Taxes - Other	5,463.81	31.02	0.10
	Taxes - Payroll	166.12	0.94	0.00
	Utilities	17,382.77	98.70	0.32
	Veterinary Fees and Medicine	22,548.72	128.03	0.41
	Other Farm Expenses	6,478.13	36.78	0.12
	Marketing & Hedging	7,058.89	40.08	0.13
	Other Crop Expenses	7,016.64	39.84	0.13
	Other Livestock Expenses	44,039.21	250.05	0.81
	- Change in Prepaid Expenses	9,845.25	55.90	0.18
	Change in Accounts Payable	6,700.50	38.04	0.12
	Depreciation on Purchased Breeding Livestock	16,714.61	94.90	0.31
	Total Basic Cost	**525,955.15**	**2,986.28**	**9.62**

Table 1, Con't
Cost of Production, 2009

Report Basis: Whole farm, per Head, Per Hundredweight Equivalent

Interest Cost			
Mortgage Interest	15,831.90	89.89	0.29
Other Interest	23,695.75	134.54	0.43
Total Interest Cost	**39,527.65**	**224.43**	**0.72**
Labor Cost			
Employee Benefits - Dependents	3,466.00	19.68	0.06
Employee Benefits - Non-Dependents	13,655.06	77.53	0.25
Labor Hired - Dependents	6,063.09	34.43	0.11
Labor Hired - Non-Dependents	67,629.49	383.99	1.24
Pension and Profit-Sharing Plans - Non-Dependents	36.84	0.21	0.00
Pension and Profit-Sharing Plans - Dependents	0.00	0.00	0.00
Value of Unpaid Labor & Management	51,912.70	294.75	0.95
Total Labor Cost	**142,763.19**	**810.58**	**2.61**
Depreciation & Equity Cost			
Machinery, Equipment, Building Depreciation	65,275.13	370.62	1.19
Interest on Equity Capital	44,751.31	254.09	0.82
Total Depreciation & Equity Cost	**110,026.45**	**624.71**	**2.01**
Total Expenses	**818,272.43**	**4,646.00**	**14.97**
Total Income - Total Expenses	**(120,750.45)**	**(685.60)**	**(2.21)**

Table 1
Results-Per Farm, Per Cow, Per CWT EQ

Table 1 shows a Basic Cost of $2,986 per cow and $9.62 per CWT EQ. The total income per cow was $3,960 in 2009. Table 1 shows an economic loss averaging -$120,750 per farm in 2009 or a loss of $686 per cow. This means that the average farm was unable to contribute to the farm manager's unpaid labor and management or the equity capital in 2009. The cost assigned to the farm manager's unpaid labor and management was $51,913 and the opportunity cost of the owner's equity capital was $44,751. These are non-cash costs however, cash is typically withdrawn for family living purposes and these costs are 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 income tax form. It also shows opportunity cost for the unpaid labor and management and interest on equity capital.

Table 1 records the average per cow costs for all farms summarized. The purchased feed per cow declined in 2009 to $1,037 under 2008 at $1,201 by $164 per cow. Purchased feed costs per cow were $942, $747, $843, $891, $695 and $638, in 2007, 2006, 2005, 2004, 2003 and 2002 respectively. Supplies declined to $103 per cow in 2009 after exhibiting a variable but significant increase to $119 per cow in 2008, $120 per cow in 2007, $106 per cow in 2006 and $112 per cow in 2005. Major cost increases in 2009 over 2008 were limited to six cost categories; Other Livestock Expense- $46.84, Custom Heifer Raising- $15.02 and Cost of Items for Resale of $0.35. The change in Prepaid Expense and Accounts Payable increased by $38 and $29 respectively as well as Depreciation on Purchased Livestock recording a gain of $25/cow.

All other Basic Cost categories declined with Feed Purchased leading the reduction by -$164 followed by Gasoline, Fuel and Oil at $63.24, Machinery repairs at $35 and Custom Hire (Machine Work) at $17/cow.

Interest costs per cow once again increased in 2009 on a per cow basis to $224. Interest paid per cow was $210, $236, $222, $185, $175 and $185 in 2008, 2007, 2006, 2005, 2004 and 2003 respectively. Negative cash returns and a $28.60 increase in Accounts Payable to $38.04/cow likely lead to increased interest payments.

Paid labor costs continued their upward trend increasing to $516 per cow in 2009. This is only a $3.00 per cow increase over 2008. Previously Paid Labor cost in 2008 registered a $32.00 per cow increase over 2007 although 2007 labor costs were down $1.86 per cow from 2006. Labor costs increased for dependents in 2009 by less than a dollar, declining in 2008 as it had in 2006 and 2005 but with 2007 documenting a slight increase. The trend previous to 2007 may be explained by the increase in the number of farms milking more cows with a higher percentage of paid versus unpaid family labor.

Table 2
Net Farm Income in 2009

Net Farm Income from Operations (NFIFO Summary)	Per Farm	Per Head	Per CWT
Total Allocated Costs	721,608	4,097	13.20
Net Farm Income From Operations (NFIFO)	(24,086)	(137)	(0.44)
Gain (Loss) on Sale of All Farm Capital Assets	5,639	32.01	0.10
Net Farm Income (NFI)	(18,448)	(105)	(0.34)

Table 2 shows the average Net Farm Income in 2009 was -$105 per cow a decline from $805 in 2008. Net Farm Income per cow and economic return were both negative in 2009 and, the average herd experienced an economic loss in 2009 as opposed to significant gains in 2008 as in 2007. Net Farm Income is total farm income minus all farm expenses except the Value of Unpaid Labor and Management and, Interest on Equity Capital. After charges for Unpaid Labor and Management and for Equity Capital is deducted from 2009 Net Farm Income, an economic loss of -$654 per cow results.

Net Farm Income is sometimes used as a proxy for the dollars a farm manager has available to pay family living expenses and income and Social Security taxes. This is a fine proxy, but it is not very accurate because some of the incomes and expenses used to calculate Net Farm Income are non-cash (depreciation and others). Also some wages and benefits deducted as 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 2009

Economic Depreciation						
Range in Herd Size	**<=50 Cows**	**51 to 75**	**76 to 100**	**101 to 150**	**151 to 250**	**> 250 Cows**
Number of Farms	79	125	76	73	57	73
Cows per Farm	42	63	87	125	194	644
Total Number of Cows	3,307	7,920	6,621	9,115	11,070	47,035
Milk Sold per Cow (lbs)	18,328	20,233	21,017	21,359	22,225	24,298
Dairy Livestock Sales per Cow	$238	$277	$248	$246	$195	$185
Crop Acres per Cow	4.78	4.46	3.81	3.3	2.7	1.47
Total Crop Acres Farmed	200	283	332	412	524	947
Cost of Items for Resale	53.73	95.26	69.91	559.36	0.00	15.41
Breeding Fees	2,208.38	3,550.22	4,849.84	7,004.89	11,688.15	34,831.04
Car and Truck Expenses	1,834.53	1,771.31	2,067.41	2,549.88	2,652.87	5,093.59
Chemicals	2,543.75	4,606.72	9,054.41	7,810.08	10,327.65	19,979.19
Custom Heifer Raising Expenses	0.00	308.75	0.00	141.40	539.79	40,882.37
Custom Hire (Machine Work)	2,762.84	9,771.38	10,234.62	16,180.19	27,392.91	88,792.22
Feed Purchased	29,343.06	42,755.03	65,966.34	108,788.29	178,967.07	786,269.68
Fertilizer and Lime	6,458.03	12,765.75	12,595.43	17,011.27	23,633.98	40,307.82
Freight and Trucking	2,566.95	3,828.26	3,876.35	5,783.60	8,727.77	29,952.48
Gasoline, Fuel, and Oil	5,798.72	9,106.74	12,363.95	18,426.30	23,215.93	67,371.12
Farm Insurance	3,656.00	5,402.21	6,850.11	9,134.90	11,132.75	21,423.11
Rent/Lease Equipment	217.08	867.68	887.93	1,015.45	2,646.53	13,366.00
Rent/Lease Other	3,718.87	8,726.35	15,475.08	17,646.04	29,653.92	88,379.52
Repairs and Maintenance	643.72	2,204.46	1,260.62	2,640.16	4,432.80	5,200.21
Building and Fence Repairs	1,391.51	2,522.24	4,498.16	6,235.45	6,549.73	27,737.92
Machinery Repairs	6,643.77	11,084.81	13,059.64	19,700.18	26,512.95	62,080.15
Seeds and Plants Purchased	5,541.20	8,918.74	12,745.59	17,932.90	21,925.22	31,628.85
Supplies Purchased	6,680.04	9,315.74	12,158.95	17,111.34	23,504.20	48,681.19
Taxes	2,765.42	3,780.05	4,322.42	5,393.00	7,214.14	12,258.61
Utilities	5,704.06	8,522.73	10,751.33	14,468.08	20,299.49	52,733.86
Veterinary Fees and Medicine	4,022.38	7,230.43	9,706.14	14,488.21	24,570.94	88,679.56
Other Farm Expenses	4,599.11	11,753.60	15,802.62	24,495.73	43,665.24	280,876.06
Marketing & Hedging	1,486.44	2,378.05	3,048.61	4,442.86	6,992.55	27,947.38
- Change in Prepaid Expenses	2,131.00	4,535.43	4,207.17	454.67	7,230.36	44,587.83
Change in Accounts Payable	294.45	1,283.36	753.37	4,297.64	13,277.50	26,367.94
Depreciation on Purchased Breeding Livestock	(23.92)	1,770.98	3,728.32	10,068.78	15,576.23	81,471.99
Basic Costs	**103,041.12**	**178,856.28**	**240,334.32**	**353,780.65**	**552,330.67**	**2,026,915.10**
Mortgage Interest	1,961.03	5,230.75	5,946.75	14,964.32	21,954.45	55,373.84
Other Interest	3,518.52	6,674.98	8,542.57	12,604.51	21,668.44	103,126.66
SST & Emp Bens (Dep)	4,223.62	3,335.01	3,733.83	2,902.86	4,049.56	2,699.08
SST & Emp Bens (Non-dep)	1,517.62	5,197.41	7,299.25	8,839.77	13,296.30	52,984.82
Labor Hired (Dependents)	3,378.41	3,517.31	5,743.12	4,026.82	6,217.14	15,576.73
Labor Hired (Non-dep)	2,995.27	13,930.03	21,035.50	42,240.00	71,598.01	300,326.82
Dpr - Mach, equip, build	19,173.98	28,793.78	34,382.11	51,370.09	72,960.59	217,700.17
Total Allocated Costs	**139,809.57**	**245,535.55**	**327,017.45**	**490,729.02**	**764,075.16**	**2,774,703.22**
Total Farm Incomes	143,233.54	260,601.43	348,164.88	498,864.17	744,959.23	2,570,852.07
NFIFO*	**3,423.97**	**15,065.88**	**21,147.43**	**8,135.15**	**(19,115.93)**	**(203,851.15)**
Gain (loss) on sale of all Farm Capital Assets	497.05	1,686.30	3,306.22	2,138.67	24,849.60	8,897.89
NFI	**3,921.02**	**16,609.78**	**24,453.65**	**10,273.82**	**5,733.67**	**(194,953.26)**
NFI + Dependents Labor and Benefits						
*Net Farm Income from Operations						

Table 3
Results - per Farm

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-76 to 100" column is used as an example. Please be careful when comparing your farm to Table 3. Even though the table is broken down into different herd size categories the herd size range in each category is wide. *NOTE: Tables 4, 5 and 6 can be used without this caution because they are generated with standardized data on a per- cow, CWT EQ. or Percent of Gross revenue report basis.*

There were 76 herds in the data set that had more than 76 cows and less than 101 cows. Those herds averaged 87 cows per farm and sold an average of 21,017 pounds of milk per cow. They had an average of 3.8 crop acres per cow and farmed 332 acres of cropland.

The average amount of purchased feed was $65,966 per farm. In addition, they paid $9,054 for Crop Chemicals, $12,595 for Fertilizer & lime, $18,819 for Repairs and $9,706 for Vet & Medicine expense. In 2008 these costs were: $75,044 per farm, $7,976 for crop chemicals, $15,990 for fertilizer, $24,888 for repairs and $10,848 for vet & medicine expense respectively. Expenses in only six categories trended higher in 2009 including Cost of Items for Resale, Chemicals, Farm Insurance, Rent/Lease Equipment, Taxes and Change in Prepaid Expenses. All other Basic Costs were lower than 2008 costs. In 2009 there was an increase in Prepaid Expenses of $4,207 as well as an increase of $753 in Accounts Payable. Dairy farm mangers obviously delayed repair and maintenance expense in both categories.

Total Basic Costs for the 76-100 cow herd size farms was $240,344 in 2009 down from $270,233 in 2008, but a slight increase over $238,570 in 2007, $204,923 in 2006; $214,420 2005, and $204,847 per farm in 2004.

In addition to Basic Costs the 2009 group of farms paid $26,778 in Labor ($5,743 to dependents and $21,035 to Non-Dependents). This is approximately $244 less than in 2008, $1,504 more than 2007, $72 more than 2006 and $288 more than in 2005. Social Security Taxes plus Benefits totaled $11,033 ($3,734 for Dependents and 7,299 for Non-Dependents) in 2009 compared to $10,026 in 2008 versus $10,305 in 2007, $10,082 in 2006 and $8,748 in 2005. This continues a general increasing trend in the benefits portion of an agricultural employee's benefit package. In our sample, it increased 2.2 percent from 2006 to 2007, decreased 2.8% in 2008 but increased again by 11% in 2009. Interest Expense was $14,490 ($5,947 Mortgage + $8,643 Other). This is a decrease of approximately $949 from 2008. In 2009, $38,110 of Depreciation was claimed. Some of that depreciation of $3,728 was taken on purchased livestock.

The Total Allocated Costs were $327,017 in 2009 versus $360,475 in 2008, $325,908 in 2007, $350,442 per farm in 2006 and $356,330 in 2005. The Total Income per farm was $348,165 in 2009, $450,547 in 2008, $421,210 in 2007 and -$19,387 and $5,473 in 2006 and 2005 respectively. The Net Farm Income from Operations (NFIFO) in 2009 was $21,147 while 2008 was $90,072, 2007 was $95,302 compared to $45,737 in 2006 and $69,403 in 2005. The total return to the owner-operator-manger's (and unpaid family's) labor, management and equity capital is the last line in Table 3 of $24,454. It has the amount paid to dependents added to the NFI.

When comparing NFIFO in 2009 to those in 2008, all farm size categories had substantial declines, most in the 100 percent range. Herds in the 51-75 cow herd size that experienced the lowest decrease in NFIFO at 76%. However, the largest size (> 250 cows) had a decline in NFIFO of over 153 percent or in absolute terms, -$562,776 under 2008.

Table 4
Milk Production Costs per Cow in 2009

Economic Depreciation						
Range in Herd Size	**<=50 Cows**	**51 to 75**	**76 to 100**	**101 to 150**	**151 to 250**	**> 250 Cows**
Number of Farms	79	125	76	73	57	73
Cows per Farm	42	63	87	125	194	644
Total Number of Cows	3,307	7,920	6,621	9,115	11,070	47,035
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Dairy Livestock Sales per Cow	$238	$277	$248	$246	$195	$185
Crop Acres per Cow	4.78	4.46	3.81	3.3	2.7	1.47
Total Crop Acres Farmed	200	283	332	412	524	947
Cost of Items for Resale	1.28	1.50	0.80	4.48	0.00	0.02
Breeding Fees	52.76	56.04	55.67	56.10	60.18	54.06
Car and Truck Expenses	43.83	27.96	23.73	20.42	13.66	7.91
Chemicals	60.77	72.71	103.93	62.55	53.18	31.01
Custom Heifer Raising Expenses	0.00	4.87	0.00	1.13	2.78	63.45
Custom Hire (Machine Work)	66.00	154.23	117.48	129.58	141.05	137.81
Feed Purchased	700.99	674.85	757.18	871.27	921.51	1,220.31
Fertilizer and Lime	154.28	201.49	144.57	136.24	121.69	62.56
Freight and Trucking	61.32	60.43	44.49	46.32	44.94	46.49
Gasoline, Fuel, and Oil	138.53	143.74	141.92	147.57	119.54	104.56
Farm Insurance	87.34	85.27	78.63	73.16	57.32	33.25
Rent/Lease Equipment	5.19	13.70	10.19	8.13	13.63	20.74
Rent/Lease Other	88.84	137.74	177.63	141.32	152.69	137.17
Repairs and Maintenance	15.38	34.80	14.47	21.14	22.82	8.07
Building and Fence Repairs	33.24	39.81	51.63	49.94	33.72	43.05
Machinery Repairs	158.72	174.96	149.90	157.78	136.52	96.35
Seeds and Plants Purchased	132.38	140.77	146.30	143.62	112.89	49.09
Supplies Purchased	159.58	147.04	139.56	137.04	121.02	75.55
Taxes	66.06	59.66	49.62	43.19	37.15	19.02
Utilities	136.27	134.52	123.41	115.87	104.52	81.84
Veterinary Fees and Medicine	96.09	114.13	111.41	116.03	126.52	137.63
Other Farm Expenses	109.87	185.51	181.40	196.18	224.83	435.92
Marketing & Hedging	35.51	37.54	34.99	35.58	36.01	43.37
- Change in Prepaid Expenses	50.91	71.59	48.29	3.64	37.23	69.20
Change in Accounts Payable	7.03	20.26	8.65	34.42	68.37	40.92
Depreciation on Purchased Breeding Livestock	(0.57)	27.95	42.79	80.64	80.20	126.45
Basic Costs	**2,461.60**	**2,823.07**	**2,758.64**	**2,833.34**	**2,843.97**	**3,145.80**
Mortgage Interest	46.85	82.56	68.26	119.85	113.04	85.94
Other Interest	84.06	105.36	98.05	100.95	111.57	160.05
SST & Emp Bens (Dep)	100.90	52.64	42.86	23.25	20.85	4.19
SST & Emp Bens (Non-dep)	36.26	82.04	83.78	70.80	68.46	82.23
Labor Hired (Dependents)	80.71	55.52	65.92	32.25	32.01	24.18
Labor Hired (Non-dep)	71.56	219.87	241.45	338.29	368.66	466.11
Dpr - Mach, equip, build	458.06	454.48	394.65	411.42	375.68	337.87
Total Allocated Costs	**3,340.00**	**3,875.54**	**3,753.61**	**3,930.15**	**3,934.24**	**4,306.37**
Total Farm Incomes	3,421.77	4,113.34	3,996.33	3,995.34	3,835.83	3,990.01
NFIFO*	**81.77**	**237.80**	**242.72**	**65.19**	**(98.41)**	**(316.36)**
Gain (loss) on sale of all Farm Capital Assets	11.87	26.62	37.95	17.13	127.95	13.81
NFI	**93.64**	**262.17**	**280.67**	**82.32**	**29.54**	**(302.55)**
*Net Farm Income from Operations						

Table 4
Results – Per Cow

Table 4 shows per cow averages for six herd size categories for 2009. The 73 herds in the >250 cow category have more than three times the number of cows per herd than in the 151 – 250 cow category, five times the number of cows per herd in the 101 – 150 cow category and seven times the number of cows per herd in the 76-100 cow grouping.

Table 4 also indicates that the larger herds (based on cow numbers) have fewer crop acres per cow and lower taxes per cow. However, larger farms have higher Purchased Feed costs, $1,220 versus $701 for the smallest herds of the six categories. Larger farms cost per cow was also higher for Custom Heifer Raising, Veterinary Fees and Medicine, Other Farm Expenses, Marketing and Hedging, Other Interest, Employee Benefits (Non-dependents) and Hired Labor.

All herd size categories recorded increases in Prepaid Expenses. Only the <50 cow category showed a decline in Accounts Payable.

Basic Cost in the largest herd size category exceeded the Basic Cost in the smallest category by $684 per cow ($3,146 vs. $2,462). This amount appeared to be $759 in 2008. The 2009 difference is largely due to Purchased Feed cost, Hired Labor, Other Farm Expenses and Other Interest. Other Interest paid per cow increases steadily from the smallest to largest herd summary category. The larger herds filed lower costs per cow in the Car & Truck Expense, Chemicals, Fertilizer & Lime, Gasoline, Fuel & Oil, Farm Insurance, Repairs and Maintenance, Machinery Repair, Seeds & Plants Purchased, Supplies Purchased, Taxes, Utilities, SST & Employee Benefits for Dependants, Labor Hired Dependents and Depreciation- Machinery, equipment and buildings categories. The <50 cow per herd category registered the highest per cow expense for Car and Truck Expense, Freight and Trucking, Farm Insurance, Supplies Purchased, Taxes, Utilities, SST & Employee Benefits (Dependents), Labor Hired (Dependents) and Depreciation. The NFIFO between the largest and smallest herd categories was $398 per cow in favor of the small herd category.

Total Allocated Costs per cow are $966 ($4,306 versus $3,340) higher in the largest farm size category than the <50 cow group. The larger herds also generated, on average, $568 more Total Income per cow as compared to the smallest herds.

Basic Cost of Production per Hundredweight Equivalent

Cost of Production per Unit Calculation Method Used

There are three commonly used methods to calculate cost of production per unit produced. 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 methods yield the same values if the production process has only a single product. However, if the production process has joint products the results can be quite different. Dairy farms typically produce several products in addition to milk including cull cows and calves, cooperative dividends, government payments, tax credits and crop-related government payments. Therefore, knowing the cost of production per unit calculation method used is essential to interpretation of the results.

Each method of calculating the cost of production per unit has advantages and disadvantages. This study uses the "Cost per Unit of Equivalent Production" method to calculate the cost of producing milk. It was chosen because using this method allows the direct comparison of costs, total as well as any individual expense category, to the milk price (U. S. All Milk Price).When comparing different farm's COP using CWT EQ, the high cost producer is always the low margin producer and the low cost producer is always the high margin producer if the same milk price is use, i.e. the U. S. All Milk Price.

"Total Allocated Expenses" are Total Expenses minus the value of unpaid labor, management and equity. "Basic Costs" are Total Allocated Expenses minus interest paid, and 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 milk composition, other premiums, farm debt structure and the amount of paid versus unpaid labor or depreciation claimed.

An Average Basic Cost of $9.62 in 2009 per CWT EQ was calculated by summing total Basic Costs on all farms and dividing by the number of CWT EQ produced. Forty-three percent of farms had a Basic Cost of $12.00 per CWT EQ or less, a decrease from 81% in 2008. Table 7 lists selected ranges of Basic Costs with the number and percent of farms in each range. Note there were declining percentages recorded during 2004-2007.

The $9.62 average Basic Cost means the average farmer in the study had a $3.21 (The U.S. average milk price in 2009 of $12.83 minus basic expenses of $9.62 per CWT EQ) of income available per CWT EQ to use for other costs; versus $6.77 in 2008. Other costs are items such as hired labor, scheduled principal and interest payments, a down payment when purchasing assets and/or family living draw.

Table 5
Milk Production Costs per CWT EQ in 2009

Economic Depreciation						
Range in Herd Size	**<=50 Cows**	**51 to 75**	**76 to 100**	**101 to 150**	**151 to 250**	**> 250 Cows**
Number of Farms	79	125	76	73	57	73
Cows per Farm	42	63	87	125	194	644
Total Number of Cows	3,307	7,920	6,621	9,115	11,070	47,035
Milk Sold per Cow (lbs)	18,328	20,233	21,017	21,359	22,225	24,298
Dairy Livestock Sales per Cow	$238	$277	$248	$246	$195	$185
Crop Acres per Cow	4.78	4.46	3.81	3.3	2.7	1.47
Total Crop Acres Farmed	200	283	332	412	524	947
Cost of Items for Resale	0.00	0.00	0.00	0.01	0.00	0.00
Breeding Fees	0.20	0.17	0.18	0.18	0.20	0.17
Car and Truck Expenses	0.16	0.09	0.08	0.07	0.05	0.03
Chemicals	0.23	0.23	0.33	0.20	0.18	0.10
Custom Heifer Raising Expenses	0.00	0.02	0.00	0.00	0.01	0.20
Custom Hire (Machine Work)	0.25	0.48	0.38	0.41	0.47	0.44
Feed Purchased	2.61	2.09	2.42	2.78	3.07	3.90
Fertilizer and Lime	0.58	0.63	0.46	0.44	0.40	0.20
Freight and Trucking	0.23	0.19	0.14	0.15	0.15	0.15
Gasoline, Fuel, and Oil	0.52	0.45	0.45	0.47	0.40	0.33
Farm Insurance	0.33	0.26	0.25	0.23	0.19	0.11
Rent/Lease Equipment	0.02	0.04	0.03	0.03	0.05	0.07
Rent/Lease Other	0.33	0.43	0.57	0.45	0.51	0.44
Repairs and Maintenance	0.06	0.11	0.05	0.07	0.08	0.03
Building and Fence Repairs	0.12	0.12	0.16	0.16	0.11	0.14
Machinery Repairs	0.59	0.54	0.48	0.50	0.45	0.31
Seeds and Plants Purchased	0.49	0.44	0.47	0.46	0.38	0.16
Supplies Purchased	0.60	0.46	0.45	0.44	0.40	0.24
Taxes	0.25	0.18	0.16	0.13	0.12	0.06
Utilities	0.51	0.42	0.39	0.37	0.35	0.26
Veterinary Fees and Medicine	0.36	0.35	0.36	0.37	0.42	0.44
Other Farm Expenses	0.41	0.58	0.58	0.63	0.75	1.39
Marketing & Hedging	0.13	0.12	0.11	0.11	0.12	0.14
- Change in Prepaid Expenses	0.19	0.22	0.15	0.01	0.12	0.22
Change in Accounts Payable	0.03	0.06	0.03	0.11	0.23	0.13
Depreciation on Purchased Breeding Livestock	0.00	0.09	0.14	0.26	0.27	0.40
Basic Costs	9.20	8.77	8.82	9.04	9.48	10.06
Mortgage Interest	0.17	0.26	0.22	0.38	0.38	0.27
Other Interest	0.31	0.33	0.31	0.32	0.37	0.51
SST & Emp Bens (Dep)	0.38	0.16	0.14	0.07	0.07	0.01
SST & Emp Bens (Non-dep)	0.14	0.25	0.27	0.23	0.23	0.26
Labor Hired (Dependents)	0.30	0.17	0.21	0.10	0.11	0.08
Labor Hired (Non-dep)	0.27	0.68	0.77	1.08	1.23	1.49
Dpr - Mach, equip, build	1.71	1.41	1.26	1.31	1.25	1.08
Total Allocated Costs	**12.48**	**12.03**	**12.00**	**12.53**	**13.12**	**13.76**
Total Farm Incomes	12.76	12.76	12.76	12.76	12.76	12.76
NFIFO*	**0.28**	**0.73**	**0.76**	**0.23**	**(0.36)**	**(1.00**
Gain (loss) on sale of all Farm Capital Assets	0.04	0.08	0.12	0.05	0.43	0.04
NFI	**0.32**	**0.81**	**0.88**	**0.28**	**0.07**	**(0.96**
*Net Farm Income from Operations						

Table 5
Results – Per CWT EQ

Table 5 records the cost of milk per CWT EQ for six herd size ranges. Purchased feed cost increased by $1.80 ($3.90 versus $2.09) per CWT EQ from the next to smallest to the largest herd size category. This is offset by lower expenditures on Car & Truck Expense (-$0.13), Chemical (-$0.13), Fertilizer & Lime (-$0.38), Gasoline, Fuel & Oil (-$0.19), Farm Insurance (-$0.22), Repairs & Maintenance(-$0.03), Machinery Repairs (-$0.28), Seeds & Plants Purchased (-$0.33), Purchased Supplies (-$0.36), Taxes (-$0.19), Utilities (-$0.25), Employee Benefits (-$0.37), Labor Hired (Dependants) (-$0.22) and Depreciation – machinery, equipment, buildings (-$0.63) for a total of ($3.71) per CWT EQ for the large herd category. Because unpaid family labor is underutilized on larger farms, their Hired Labor Expense was $1.22/CWT EQ higher than herds in the smallest category.

Vet & Medicine cost are approximately 19% higher per CWT EQ for large herds than herds in the 51-75 cow range. The difference in 2008 was 36%. Other Expenses increase by $0.98 per CWT EQ from the smallest to the largest herd sizes summarized. A portion of this may be the cost of estrus synchronization programs.

The “51-75 cow” farms record the lowest Basic Costs of $8.77 per CWT EQ. The range in Basic Cost per CWT EQ among farm size groups is $1.29 versus $1.35 in 2008, $1.22 in 2007, $0.35 in 2006 and $0.01 in 2005. From lowest to highest Livestock Depreciation is $0.00 per CWT EQ in the smallest herd size group and $0.40 in the “>250” herd size category.

The “75-100 cow” herd size range turned in the highest NFIFO per CWT EQ in 2009 at $0.76. In 2008 the highest NFIFO was $4.04, in 2007 $4.88, 2006 was $1.91 and in 2005, $2.92. The largest herd size category filed the lowest NFIFO per CWT EQ of $1.00 for 2009. However, when the amount paid to family members is added back into NFI and multiplied by the number of CWT EQ per farm, the return to the owner-manager-operator-managers tell a different story. The larger herds return an average of $14,083 for family living and return to equity capital versus $5,520 for those in the “<50 cow” herd-size category. The difference in 2008 was $327,112 in favor of the larger herds. Note: this point was made earlier but because of its importance is stated here again.

Table 6
Milk Production Costs as % of Revenue 2009

Economic Depreciation						
Range in Herd Size	**<=50 Cows**	**51 to 75**	**76 to 100**	**101 to 150**	**151 to 250**	**> 250 Cows**
Number of Farms	79	125	76	73	57	7
Cows per Farm	42	63	87	125	194	64
Total Number of Cows	3,307	7,920	6,621	9,115	11,070	47,03
Milk Sold per Cow (lbs)	18,328	20,233	21,017	21,359	22,225	24,29
Dairy Livestock Sales per Cow	$238	$277	$248	$246	$195	$18
Crop Acres per Cow	4.78	4.46	3.81	3.3	2.7	1.4
Total Crop Acres Farmed	200	283	332	412	524	94
Cost of Items for Resale	0.04	0.04	0.02	0.11	0.00	0.00
Breeding Fees	1.54	1.36	1.39	1.40	1.57	1.35
Car and Truck Expenses	1.28	0.65	0.59	0.51	0.36	0.20
Chemicals	1.78	1.77	2.60	1.57	1.39	0.78
Custom Heifer Raising Expenses	0.00	0.12	0.00	0.03	0.07	1.59
Custom Hire (Machine Work)	1.93	3.75	2.94	3.24	3.68	3.45
Feed Purchase	20.49	16.41	18.95	21.81	24.02	30.58
Fertilizer and Lime	4.51	4.90	3.62	3.41	3.17	1.57
Freight and Trucking	1.79	1.47	1.11	1.16	1.17	1.17
Gasoline, Fuel, and Oil	4.05	3.49	3.55	3.69	3.12	2.62
Farm Insurance	2.55	2.07	1.97	1.83	1.49	0.83
Rent/Lease Equipment	0.15	0.33	0.26	0.20	0.36	0.52
Rent/Lease Other	2.60	3.35	4.44	3.54	3.98	3.44
Repairs and Maintenance	0.45	0.85	0.36	0.53	0.60	0.20
Building and Fence Repairs	0.97	0.97	1.29	1.25	0.88	1.08
Machinery Repairs	4.64	4.25	3.75	3.95	3.56	2.41
Seeds and Plants Purchased	3.87	3.42	3.66	3.59	2.94	1.23
Supplies Purchased	4.66	3.57	3.49	3.43	3.16	1.89
Taxes	1.93	1.45	1.24	1.08	0.97	0.48
Utilities	3.98	3.27	3.09	2.90	2.72	2.05
Veterinary Fees and Medicine	2.81	2.77	2.79	2.90	3.30	3.45
Other Farm Expenses	3.21	4.52	4.53	4.91	5.85	10.93
Marketing & Hedging	1.04	0.91	0.88	0.89	0.94	1.09
- Change in Prepaid Expenses	1.49	1.74	1.21	0.09	0.97	1.73
Change in Accounts Payable	0.21	0.49	0.22	0.86	1.78	1.03
Depreciation on Purchased Breeding Livestock	(0.02)	0.68	1.07	2.02	2.09	3.17
Basic Costs	**71.95**	**68.60**	**69.02**	**70.90**	**74.14**	**78.84**
Mortgage Interest	1.37	2.01	1.71	3.00	2.95	2.15
Other Interest	2.46	2.56	2.45	2.53	2.91	4.01
SST & Emp Bens (Dep)	2.95	1.28	1.07	0.58	0.54	0.10
SST & Emp Bens (Non-dep)	1.06	1.99	2.10	1.77	1.78	2.06
Labor Hired (Dependents)	2.36	1.35	1.65	0.81	0.83	0.61
Labor Hired (Non-dep)	2.09	5.35	6.04	8.47	9.61	11.68
Dpr - Mach, equip, build	13.39	11.05	9.88	10.30	9.79	8.47
Total Allocated Costs	**97.63**	**94.19**	**93.92**	**98.36**	**102.55**	**107.92**
Total Farm Incomes	100	100	100	100	100	10
NFIFO*	**2.37**	**5.81**	**6.08**	**1.64**	**(2.55)**	**(7.92**
Gain (loss) on sale of all Farm Capital Assets	0.35	0.65	0.95	0.43	3.34	0.35
NFI	**2.72**	**6.46**	**7.03**	**2.07**	**0.79**	**(7.57**
*Net Farm Income from Operations						

Table 6
Results - Percent of Gross Revenue

The complications faced and explanations offered to deal with the various cost of production methods are in large part due to our historic desire to put cost of production in units of the standard amounts/weights of product produced/marketed. The alternative is a method used by almost all other businesses - costs Per Dollar or Percent of Revenue. With this method it doesn't matter whether the price between years or farms is the same, the results are comparable.

Table 6 itemizes the average costs of production in six herd size categories as a percentage of gross revenue. To assist in your understanding of the table, the "Range in Herd Size-76 to 100" column is used as an example. For this group of farms there were 76 herds in the data set that had more than 76 cows and less than 101 cows. Those herds averaged 87 cows per farm and sold an average of 21,017 pounds of milk per cow. In addition to milk and other farm commodity sales, this group of farms also had average Dairy Livestock Sales per Cow of $248. This group of farms averaged of 3.81 crop acres per cow and farmed 332 acres of cropland.

The average percentage of revenue represented by Purchased Feed was 18.95%. In addition, these farms paid 2.6% of gross revenue for Crop Chemicals, 3.62% for Fertilizer & Lime, 5.04% for Repairs and 2.79% for Veterinary & Medicine costs. In 2009 there was an increase in Prepaid Expenses totaling 1.21% of revenue as well as an increase of 0.22% of revenue in Accounts Payable. Other Interest was 2.45% of total revenue in 2009.

Total Basic Costs for the 76-100 cow herd size farms totaled 69.02% of revenue in 2009. In addition to Basic Costs the 2009 group of farms paid 7.69% of revenue in Hired Labor (1.65% to Dependents and 6.04% to Non-dependents).

Social Security Taxes plus Benefits totaled 3.17% of revenues (1.07% for Dependents and 2.1% for Non-dependents) in 2009. There was also 4.16% (1.71% plus 2.45%) of interest expenses. In 2009, Depreciation claimed amounted to 10.95% of revenue. Some of that depreciation (1.07%) was taken on purchased livestock.

The Total Allocated Costs are 93.92% in 2009. The Total Income this year and every year when evaluated on a % of Gross Revenue is always 100%. The Net Farm Income from Operations (NFIFO) in 2009 was 6.09% compared to 19.99% in 2008. Net Farm Income totaled 7.03% versus 20.46% of revenues in 2008.

With milk cost of production on a Per Dollar or Percent of Gross Revenue basis, units and value of product produced become mute points. With Per Dollar or Percentage of Revenue, it doesn't matter whether the business produces single or joint products.

Check Table-6 values against your costs to see if you are competitive. For example, my Total Allocated Costs are 95% of my Total Gross Revenue, what does it mean? It means that you are competitive with those whose costs are above 95% and less so with those who's are below. Compared to the average over all herd sizes of the 2009 AgFA database of 99.1% you would be somewhat more competitive. You may still want to go back to the itemized costs comparing yours to the AgFA average to pinpoint opportunities for improvement.

The percent of gross revenue approach recognizes the number one goal of business, to create wealth. Productivity and profitability measures are now in terms of dollars produced versus bushels, tons, pounds or CWT of produce marketed. With cost of production as a Per-Dollar or Percentage of Gross Revenue value, the relationships between costs and sales are automatic.[5]

Table 7
Number of Herds in Basic Cost Production Ranges in 2009

Expense per CWT EQ	Number of Farms*	Percent of Farms**
Less than $6.00	9	1.9%
6.01 – 7.00	37	7.8
7.01 – 8.00	63	13.3
8.01 – 9.00	106	22.4
9.01 – 10.00	111	23.5
10.01- 11.00	68	14.4
11.01 – 12.00	38	8.0
12.00 – 13.00	16	3.4
13.00 - 14.00	12	2.5
14.00 – 15.00	8	1.7
Greater than $15.00	5	1.1

*****Total farms in this analysis is 483
****** Percent column may not add to 100 due to rounding

Summary

The average herd size for herds summarized in 2009 was 176 cows. The milk sold per cow averaged 22,847 pounds. The average herd size in 2008 was 158 cows and average milk sold was 22,212 pounds.

Total economic cost of production per CWT EQ of $14.97 was $2.14 more than the U.S. All Milk Price of $12.83 in 2009. The average Wisconsin dairy producer in this data set had an economic loss of $2.21 per CWT EQ produced in 2009. In 2008 the total economic cost of production was $0.70 less than the U.S. All Milk Price. The 2007 cost of production was also less than the US All Milk Price by $1.42 per CWT EQ.

Purchased feed costs remain the largest cost item having declined in 2006 over 2005 and 2009 over 2008 but increased in 2007 and 2008. 2008 purchased feed prices were $0.58 per CWT EQ over 2007. Purchased Feed costs per cow averaged $1,037, $1,201, $942, $747, $843 and $891 for 2009, 2008, 2007, 2006, 2005 and 2004 respectively. Purchased Feed costs per CWT EQ were $3.34, $4.30, $3.72, $2.50, $2.97 and $3.41 for the same years.

Total Allocated Costs per cow averaged $4,097 in 2009 a decrease of $238 under 2008 of $4,335. The return to the dairy producer's (and family's) unpaid labor, management and equity capital (Net Farm Income from Operations) was lower at -$137 as compared to $788 in 2008, $951 in 2007, $521 in 2006 and $792 for 2005 levels.

[5] Bolton, Ken and Gary Frank. Cost of Production vs. Cost of Production And Then There is Cos of Production! University of Wisconsin/Extension, Center for Dairy Profitability, September 2009. http://cdp.wisc.edu