

## Chapter 7. Dairy -- Farm Management

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### Herd Size Comparisons

Data from the 250 New York dairy farms that participated in the Dairy Farm Business Summary (DFBS) Project in 2007 have been sorted into eight herd size categories and averages for the farms in each category are presented in Tables 7-1 and 7-2. Note that after the less than 50 cow category, the herd size categories increase by 25 cows up to 100 cows, by 100 cows up to 400 cows, and by 200 cows up to 600 cows.

As herd size increases, the net farm income increases (Table 7-1). Net farm income without appreciation averaged \$36,257 per farm for the less than 50 cow farms and \$1,156,991 per farm for those with more than 600 cows. The return to all capital without appreciation also generally increased as herd size increased.

It is more than size of herd that determines profitability on dairy farms. Farms with 600 and more cows averaged \$1,136 net farm income per cow while the less than 50 cow dairy farms averaged \$879 net farm income per cow. The 300 to 399 herd size category had the highest net farm income per cow at \$1,376, while the 400 to 499 herd size category had the second highest net farm income per cow at \$1,287. Other factors that affect profitability and their relationship to the size classifications are shown in Table 7-2.

Number of Cows	Number of Farms	Average Number of Cows	Net Farm Income without Appreciation	Net Farm Income per Cow	Labor & Management Income per Operator	Return to all Capital without Appreciation
Under 50	26	41	\$36,257	\$879	\$6,234	1.0%
50 to 74	32	63	55,492	878	18,162	2.9%
75 to 99	23	88	90,893	1,039	38,548	5.8%
100 to 199	54	142	132,264	929	47,317	6.9%
200 to 299	20	252	300,000	1,189	116,014	11.2%
300 to 399	17	351	483,595	1,376	228,039	17.1%
400 to 599	25	469	603,860	1,287	217,138	14.6%
600 & over	53	1,019	1,156,991	1,136	474,094	15.3%

This year, net farm income per cow did not exhibit the usual increase as herd size increased. All herd size categories saw an increase in operating cost of producing milk from a year earlier (Table 7-2). Net farm income per cow will increase as farms become larger if the costs of increased purchased inputs are offset by greater and more efficient output.

The farms with more than 600 cows averaged more milk sold per cow than any other size category (Table 7-2). With 24,024 pounds of milk sold per cow, farms in the largest herd size group averaged 17.6 percent more milk output per cow than the average of all herds in the summary with less than 600 cows.

Note: All data in this section are from the New York Dairy Farm Business Summary and Analysis Project unless a specific source is specified. Publications reporting Dairy Farm Business Summary data for New York, six regions of the state, for large herds, small herds, grazing farms, and farms that rent are available from the Department of Applied Economics and Management website: <http://aem.cornell.edu/outreach/publications.htm>.

The ability to reach high levels of milk output per cow with a large herd is a major key to high profitability. Three times a day milking (3X) and supplementing with bST are herd management practices commonly used to increase milk output per cow in large herds. Many dairy farmers who have been willing and able to employ and manage the labor required to milk 3X have been successful. Only one percent of the 81 DFBS farms with less than 100 cows used a milking frequency greater than 2X. As herd size increased, the percent of herds using a higher milking frequency increased. Farms with 100 to 200 cows reported 11 percent of the herds milking more often than 2X, the 200-299 cow herds reported 35 percent, 300-399 cow herds reported 47 percent, 400-599 cow herds reported 52 percent, and the 600 cow and larger herds reported 72 percent exceeding the 2X milking frequency.

**TABLE 7-2. COWS PER FARM AND RELATED FARM FACTORS**  
**250 New York Dairy Farms, 2007**

Number of Cows	Average Number of Cows	Milk Sold Per Cow (lbs.)	Milk Sold Per Worker (cwt.)	Tillable Acres Per Cow	Forage DM Per Cow (tons)	Farm Capital Per Cow	Cost of Producing Milk/Cwt.	
							Operating	Total
Under 50	41	17,977	4,118	4.0	7.8	\$13,618	\$13.52	\$23.73
50 to 74	63	17,842	4,747	3.4	7.7	10,328	13.87	21.56
75 to 99	88	18,538	5,505	2.9	8.8	9,863	13.54	20.43
100 to 199	142	19,369	7,368	2.7	8.5	9,675	14.20	19.71
200 to 299	252	22,571	9,460	2.5	8.9	9,270	13.83	17.83
300 to 399	351	22,902	9,058	2.1	7.9	7,712	13.47	16.80
400 to 599	469	22,886	9,316	2.4	8.9	8,772	13.39	17.01
600 & over	1,019	24,024	11,310	1.9	7.5	7,945	14.23	17.04

Bovine somatotropin (bST) was used to a greater extent on the large herd farms. bST was used consistently during 2007 on 12 percent of the herds with less than 100 cows, 30 percent of the farms with 100 to 299 cows and on 63 percent of the farms with 300 cows and more.

Milk output per worker has always shown a strong correlation with net farm income. The farms with 100 cows or more averaged over 930,240 pounds of milk sold per worker while the farms with less than 100 cows averaged less than 479,000 pounds per worker.

In achieving the highest productivity per cow and per worker, the largest farms had the fewest crop acres per cow and below average forage dry matter harvested per cow. However, the larger farms generally purchased more roughage per cow. The largest farms had the most efficient use of farm capital with an average investment of \$7,945 per cow.

The 17 farms with 300-399 cows had the lowest total cost of producing milk at \$16.80 per hundredweight. The 53 farms with more than 600 cows held their average total costs of producing milk to \$17.04 per hundredweight, \$2.54 below the \$19.58 average for the remaining 197 dairy farms. The lower average costs of production plus a similar milk price gave the managers of the largest dairy farms profit margins (milk price less total cost of producing milk) that averaged \$0.93 per hundredweight above the average of the other 197 DFBS farms. All but the two lowest herd size categories averaged a positive profit margin in 2007.

### **Ten-Year Comparisons**

The total cost of producing milk on DFBS farms has increased \$3.23 per hundredweight over the past 10 years (Table 7-3). In the intervening years, total cost of production decreased 1998 through 1999, increased in 2000 and 2001, fell in 2002, again increased in 2003 and 2004, decreased in 2005 and 2006, and increased in 2007. It is interesting to note that costs of production decrease in low milk price years and increase in high milk price years. Over the 10 years, milk sold per cow and cows per worker increased 10 percent on DFBS farms (Table 7-4). Farm net worth has increased significantly, while percent equity has been fairly stable.

**Table 7-3. TEN YEAR COMPARISON: AVERAGE COST OF PRODUCING MILK PER HUNDREDWEIGHT**

Item	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Operating Expenses</b>										
Hired labor	\$2.06	\$2.14	\$2.25	\$2.41	\$2.44	\$2.51	\$2.67	\$2.66	\$2.58	\$2.70
Purchased feed	4.18	3.96	3.91	4.25	4.10	4.29	4.88	4.37	4.30	5.21
Machinery repair, vehicle expense & rent	1.12	1.18	1.06	1.21	1.01	.91	1.09	1.07	1.04	1.27
Fuel, oil & grease	.25	.24	.34	.32	.28	.33	.41	.53	.58	.67
Replacement livestock	.24	.24	.23	.20	.16	.15	.16	.11	.07	.07
Breeding fees	.16	.17	.17	.19	.21	.19	.21	.22	.23	.24
Veterinary & medicine	.45	.47	.51	.54	.56	.56	.59	.62	.65	.65
Milk marketing	.53	.49	.69	.63	.65	.69	.72	.76	.80	.80
Other dairy expenses	1.09	1.13	1.16	1.26	1.25	1.30	1.27	1.32	1.29	1.41
Fertilizer & lime	.35	.35	.29	.33	.27	.26	.30	.34	.31	.40
Seeds & plants	.22	.20	.19	.20	.20	.20	.24	.22	.23	.28
Spray & other crop expense	.24	.24	.22	.25	.22	.19	.20	.19	.19	.25
Land, building & fence repair	.27	.27	.21	.26	.19	.14	.21	.25	.22	.32
Taxes	.21	.21	.20	.21	.20	.21	.22	.23	.21	.23
Insurance	.17	.16	.16	.14	.16	.15	.16	.16	.17	.19
Utilities (farm share)	.32	.31	.32	.33	.34	.34	.36	.39	.41	.44
Interest paid	.89	.83	.95	.82	.61	.56	.57	.65	.78	.83
Misc. (including rent)	.41	.44	.45	.42	.44	.40	.43	.37	.45	.49
<b>Total Operating Expenses</b>	<b>\$13.15</b>	<b>\$13.02</b>	<b>\$13.31</b>	<b>\$13.98</b>	<b>\$13.27</b>	<b>\$13.39</b>	<b>\$14.67</b>	<b>\$14.54</b>	<b>\$14.51</b>	<b>\$16.46</b>
<b>Less: Nonmilk cash receipts</b>	<b>1.18</b>	<b>1.44</b>	<b>1.83</b>	<b>1.49</b>	<b>1.91</b>	<b>1.57</b>	<b>1.70</b>	<b>1.96</b>	<b>1.94</b>	<b>1.75</b>
Increase in grown feed & supplies	.25	.25	.11	.10	.12	.27	.17	.12	.22	.39
Increase in livestock	.22	.11	.06	.52	.23	.09	.22	.21	.27	.30
<b>OPERATING COST OF MILK PRODUCTION</b>	<b>\$11.50</b>	<b>\$11.22</b>	<b>\$11.31</b>	<b>\$11.87</b>	<b>\$11.01</b>	<b>\$11.46</b>	<b>\$12.58</b>	<b>\$12.25</b>	<b>\$12.08</b>	<b>\$14.02</b>
<b>Overhead Expenses</b>										
Depreciation: machinery & buildings	\$1.08	\$1.14	\$1.20	\$1.30	\$1.39	\$1.23	\$1.32	\$1.32	\$1.26	\$1.32
Unpaid labor	.11	.11	.10	.10	.08	.10	.07	.06	.07	.07
Operator(s) labor <sup>a</sup>	.74	.80	.79	.74	.74	.70	.67	.61	.63	.65
Operator(s) management (5% of cash receipts)	.82	.83	.76	.87	.75	.73	.90	.90	.79	1.07
Interest on farm equity capital (5%)	.85	.86	.88	.91	.89	.85	.92	1.02	1.06	1.20
<b>Total Overhead Expenses</b>	<b>\$3.60</b>	<b>\$3.74</b>	<b>\$3.73</b>	<b>\$3.92</b>	<b>\$3.85</b>	<b>\$3.61</b>	<b>\$3.88</b>	<b>\$3.91</b>	<b>\$3.81</b>	<b>\$4.31</b>
<b>TOTAL COST OF MILK PRODUCTION</b>	<b>\$15.10</b>	<b>\$14.96</b>	<b>\$15.04</b>	<b>\$15.79</b>	<b>\$14.86</b>	<b>\$15.07</b>	<b>\$16.46</b>	<b>\$16.16</b>	<b>\$15.89</b>	<b>\$18.33</b>
<b>AVERAGE FARM PRICE OF MILK</b>	<b>\$15.60</b>	<b>\$14.91</b>	<b>\$13.38</b>	<b>\$15.98</b>	<b>\$12.98</b>	<b>\$13.24</b>	<b>\$16.64</b>	<b>\$15.98</b>	<b>\$13.85</b>	<b>\$20.34</b>
Return per cwt. to operator labor, capital & mgmt.	\$2.91	\$2.44	\$0.77	\$2.71	\$0.50	\$0.45	\$2.67	\$2.35	\$0.44	\$4.93
Rate of return on farm equity capital	8.0%	4.7%	-4.4%	6.0%	-5.6%	-5.7%	6.0%	4.1%	-4.6%	13.4%

<sup>a</sup>1998 = \$1,600/month, 1999 = \$1,800/month, 2000 = \$2,000/month, 2001 = \$2,100/month, 2002 = \$2,100/month, 2003 through 2005 = \$2,200/month, 2006 = \$2,300/month, and 2007 = \$2,400/month of operator labor.

**TABLE 7-4. TEN YEAR COMPARISON: SELECTED BUSINESS FACTORS  
New York Dairy Farms, 1998 to 2007**

Item	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Number of farms</b>	305	314	294	228	219	201	200	225	240	250
<b>Cropping Program</b>										
Total tillable acres	497	516	566	618	660	659	701	729	730	758
Tillable acres rented	232	234	262	290	337	323	345	365	360	385
Hay crop acres	239	248	274	302	323	321	339	361	366	364
Corn silage acres	175	186	192	210	232	233	245	246	249	258
Hay crop, tons DM/acre	3.1	2.9	3.3	2.8	3.1	3.2	3.5	3.2	3.2	3.0
Corn silage, tons/acre	18.0	16.3	15.1	16.5	15.4	17.2	17.7	18.8	18.4	18.9
Fertilizer & lime exp./till. acre	\$31	\$32	\$27	\$32	\$27	\$28	\$31	\$33	\$30	\$40
Machinery cost/cow	\$471	\$502	\$513	\$554	\$520	\$497	\$565	\$624	\$618	\$708
<b>Dairy Analysis</b>										
Number of cows	210	224	246	277	297	314	334	340	350	358
Number of heifers	155	164	186	207	226	240	260	270	283	289
Milk sold, cwt.	43,954	47,932	52,871	60,290	66,177	70,105	73,767	78,250	80,862	82,315
Milk sold/cow, lbs.	20,900	21,439	21,516	21,762	22,312	22,302	22,070	22,998	23,083	22,983
Purchased dairy feed/cwt.	\$4.18	\$3.96	\$3.91	\$4.25	\$4.10	\$4.27	\$4.86	\$4.37	\$4.29	\$5.20
Purchased grain & concentrate as % of milk	26%	25%	27%	25%	30%	30%	27%	26%	29%	24%
Purchased feed & crop expense/cwt. milk	\$5.00	\$4.75	\$4.61	\$5.03	\$4.79	\$4.92	\$5.60	\$5.12	\$5.02	\$6.13
<b>Capital Efficiency</b>										
Farm capital/cow	\$6,161	\$6,368	\$6,535	\$6,755	\$6,794	\$6,748	\$7,010	\$7,508	\$7,762	\$8,426
Real estate/cow	\$2,537	\$2,562	\$2,615	\$2,713	\$2,612	\$2,722	\$2,809	\$2,950	\$3,030	\$3,356
Machinery investment/cow	\$1,118	\$1,163	\$1,225	\$1,222	\$1,261	\$1,208	\$1,226	\$1,314	\$1,384	\$1,448
Asset turnover ratio	0.61	0.59	0.54	0.63	0.53	0.54	0.64	0.60	0.52	0.67
<b>Labor Efficiency</b>										
Worker equivalent	5.35	5.71	6.11	6.72	7.21	7.50	7.97	8.18	8.19	8.40
Operator/manager equiv.	1.62	1.76	1.83	1.94	1.82	1.86	1.64	1.60	1.63	1.62
Milk sold/worker, lbs.	821,565	839,432	865,325	897,167	917,854	934,733	925,553	956,698	987,530	980,234
Cows/worker	39	39	40	41	41	42	42	42	43	43
Labor cost/cow	\$609	\$653	\$674	\$706	\$725	\$738	\$752	\$765	\$757	\$784
Hired labor exp./hired worker equiv.	\$31,092	\$27,910	\$29,309	\$31,448	\$31,755	\$32,659	\$33,311	\$33,539	\$34,071	\$34,924
<b>Profitability &amp; Financial Analysis</b>										
Labor & mgmt. income/operator	\$55,917	\$42,942	\$-2,908	\$45,479	\$-14,243	\$-15,360	\$78,061	\$64,745	\$-31,269	\$189,019
Farm net worth, end year	\$798,297	\$865,626	\$942,881	\$1,181,055	\$1,173,836	\$1,207,964	\$1,466,674	\$1,690,427	\$1,736,505	\$2,200,655
Percent equity	59%	58%	57%	60%	57%	56%	60%	63%	62%	68%

**Dairy Operations and Milk Cow Inventory**

<b>TABLE 7-5. NUMBER OF DAIRY FARMS AND MILK COWS BY SIZE OF HERD New York State, 2007<sup>a, b</sup></b>				
Size of Herd	Farms		Milk Cows	
Number of Cows	Number	% of Total	Number	% of Total
1 - 29	1,300	21.0%	12,500	2.0%
30-49	1,300	21.0%	50,000	8.0%
50-99	2,100	33.9%	138,000	22.0%
100-199	890	14.3%	113,000	18.0%
200-499	410	6.6%	125,000	20.0%
500-749	95	1.5%	56,000	9.0%
750-999	43	0.7%	34,500	5.5%
1000-1499	38	0.6%	44,000	7.0%
1500 - 1999	9	0.15%	14,000	2.2%
2000 or more	15	0.25%	40,000	6.3%
Total	6,200	100.0%	627,000	100.0%

<sup>a</sup>This information on number of farms and number of cows by size of herd is derived from several sources:

- Dairy Statistics as published by the New York Agricultural Statistics Services for 2007.
- CAFO (Concentrated Animal Feeding Operations) permit reports for 2007. Some small CAFO farms (farms with 200 to 700 milk cows) have not applied for or updated the permit. Estimates for these farms were made so as to reflect the total number of dairy farms in New York State.

<sup>b</sup>The author wishes to thank everyone who provided some data as well as providing valuable advice and perspectives: Lee Telega, Jacqueline Lendrum, and B. F. Stanton. However, any errors, omissions or misstatements are solely the responsibility of the author, Professor George Conneman, **e-mail [gjc4@cornell.edu](mailto:gjc4@cornell.edu)**.

In 2007, there were 6,200 dairy farms in New York State, and 627,000 milk cows as reported by the NYASS. The table above was prepared based on the NYASS data plus the CAFO permit filing for additional herd size categories.

Ninety percent of the farms (less than 200 cows per farm) had 50 percent of the milk cows. The remaining ten percent of the farms had 50 percent of the cows.

About 3 percent of the farms (those with 500 or more cows) had 30 percent of the cows.

Farms with less than 50 cows represent 42 percent of all farms but kept only 10 percent of the cows.

Farms with 1,000 or more cows represent about 1 percent of the farms but kept over 15 percent of the cows.

**TABLE 7-6. CHANGE IN NUMBER OF DAIRY FARMS BY SIZE OF HERD  
New York State, 1960 to 2007**

Size of Herd (Number of Cows)	Year											
	1960 <sup>a</sup>	1965 <sup>a</sup>	1970 <sup>a</sup>	1975 <sup>a</sup>	1980	1985	1990	1995	2000	2005	2006	2007
1 - 29	23,650	13,700	9,425	7,000	6,080	5,000	2,650	2,100	1,400	1,400	1,300	1,300
30 - 49	12,450	11,750	11,000	7,350	5,420	4,550	3,150	2,200	1,500	1,300	1,300	1,300
50 - 99	3,700	4,450	5,800	6,500	6,080	5,100	5,300	4,000	3,000	2,500	2,300	2,100
100 - 199	375	550	675	1,000	1,220 <sup>b</sup>	1,550 <sup>b</sup>	1,500 <sup>b</sup>	1,300	1,400	890	920	890
200 +	25	50	100	150	200 <sup>b</sup>	300 <sup>b</sup>	400 <sup>b</sup>	400	600	610	580	610
<b>Total</b>	<b>40,200</b>	<b>30,500</b>	<b>27,000</b>	<b>22,000</b>	<b>19,000</b>	<b>16,500</b>	<b>13,000</b>	<b>10,000</b>	<b>7,900</b>	<b>6,700</b>	<b>6,400</b>	<b>6,200</b>
Number of cows (thousands)	1,180	1,090	950	905	910	942	760	710	686	648	638	627
Average size of herd (milk cows)	29	36	35	41	48	57	58	71	87	97	100	101

Sources: New York Agricultural Statistics Service; <sup>a</sup> Cornell Producer Panel of Dairy Farms. <sup>b</sup> Estimates by G. J. Conneman.

Since 1960 the number of dairy farm units has decreased from 40,200 to 6,200, a decline of 85 percent. Total number of cows in the State has declined 47 percent from 1,180,000 to 627,000.

Average size of farm increased from 29 cows per farm in 1960 to 101 cows per farm in 2007.

<b>TABLE 7-7. FORTY YEARS OF CHANGES ON DAIRY FARMS</b>					
<b>New York State, 1965 to 2005</b>					
Item	Year				
	1965	1975	1985	1995	2005
<b>SIZE OF DAIRY BUSINESS</b>					
Number of dairy farms	30,500	22,000	16,500	10,000	6,700
Farms with:					
Less than 50 cows	25,450	14,350	9,550	4,300	2,700
200 or more cows	50	150	300	400	610
Number of milk cows (thousand head)	1,090	905	942	710	648
Total milk production (billion pounds)	11.0	10.0	11.7	11.6	12.1
Cows per farm	36	41	57	71	97
<b>PRODUCTIVITY</b>					
Milk sold per cow, lbs.	10,100	11,000	12,400	16,300	18,700
Milk sold per farm, lbs.	361,000	455,000	709,000	1,160,000	1,806,000
Worker equivalent per farm	2.0	2.2	2.5	2.7	3.0
Milk sold per worker, lbs.	180,000	207,000	284,000	430,000	602,000
Cows per worker	18	19	23	26	32
Price of milk, \$/cwt.	\$4.39	\$8.75	\$12.80	\$13.00	\$15.90
Hay, all, per acre, tons	1.9	2.2	2.4	2.2	2.0
Hay, alfalfa, per acre, tons	NA	2.6	2.8	2.7	2.5
Corn silage, per acre, tons	12.6	12.9	14.0	15.0	16.5
Corn grain, per acre, bushels	70	82	97	108	123
Sources: New York Agricultural Statistics Service; Cornell Producer Panel of Dairy Farms; estimates by G. J. Conneman					

During the past 40 years (1965 to 2005) there have been dramatic changes on New York dairy farms in the number of farms, milk cows, production levels and efficiency of operations.

The number of dairy farms decreased from 30,500 in 1965 to 6,700 in 2005, a decrease of 78 percent. The average size of farm increased from 36 cows to 97 cows.

The number of dairy cows in 2005 was 648,000 head, a decrease of 41 percent from 1965. However, the total amount of milk produced increased from 11.0 billion pounds to 12.1 billion pounds as production per cow moved from 10,100 to 18,700 pounds, an increase of 85 percent in production per cow.

Efficiency of production (as measured by milk sold per worker) increased from 180,000 pounds to 602,000 pounds, more than a tripling; cows per worker increased from 18 to 32 during the 40-year period.

The number of farms with less than 50 cows decreased from 25,450 to 2,700; those with 200 or more cows increased from 50 to 610.

**TABLE 7-8. COMPARISON OF FARM BUSINESS SUMMARY DATA**  
**Same 54 New York Dairy Farms, 1998- 2007**

Selected Factors	1998	1999	2000	2001
Milk receipts per cwt. milk	\$15.73	\$15.22	\$13.41	\$15.92
<u>Size of Business</u>				
Average number of cows	289	307	325	351
Average number of heifers	224	230	245	266
Milk sold, cwt.	62,788	68,828	72,884	78,470
Worker equivalent	7.01	7.37	7.58	8.17
Total tillable acres	615	645	665	698
<u>Rates of Production</u>				
Milk sold per cow, lbs.	21,693	22,409	22,403	22,337
Hay DM per acre, tons	3.5	3.3	3.8	3.2
Corn silage per acre, tons	23	17	16	17
<u>Labor Efficiency</u>				
Cows per worker	41	42	43	43
Milk sold per worker, lbs.	895,694	933,892	961,528	960,462
<u>Cost Control</u>				
Grain & concentrate purchased as % of milk sales	25%	24%	27%	25%
Dairy feed & crop expense per cwt. milk	\$4.96	\$4.69	\$4.54	\$4.90
Operating cost of producing cwt. milk	\$11.36	\$11.07	\$11.23	\$12.31
Total cost of producing cwt. milk	\$14.27	\$12.29	\$14.18	\$15.38
Hired labor cost per cwt.	\$2.26	\$2.33	\$2.39	\$2.60
Interest paid per cwt.	\$0.88	\$0.77	\$0.91	\$0.80
Labor & machinery costs per cow	\$1,115	\$1,190	\$1,206	\$1,286
Replacement livestock expense	\$13,446	\$14,798	\$19,061	\$13,785
Expansion livestock expense	\$19,795	\$18,402	\$31,469	\$36,592
<u>Capital Efficiency</u>				
Farm capital per cow	\$6,343	\$6,531	\$6,653	\$6,653
Machinery & equipment per cow	\$1,220	\$1,256	\$1,288	\$1,268
Real estate per cow	\$2,489	\$2,505	\$2,488	\$2,508
Livestock investment per cow	\$1,517	\$1,541	\$1,602	\$1,689
Asset turnover ratio	0.63	0.62	0.56	0.65
<u>Profitability</u>				
Net farm income without appreciation	\$200,089	\$201,962	\$68,769	\$177,610
Net farm income with appreciation	\$244,451	\$245,480	\$120,631	\$281,345
Labor & management income per operator/manager	\$93,506	\$87,181	\$1,007	\$62,132
Rate return on:				
Equity capital with appreciation	18.0%	15.7%	4.6%	15.7%
All capital with appreciation	13.3%	11.9%	5.8%	11.9%
All capital without appreciation	10.9%	9.7%	3.4%	7.5%
<u>Financial Summary, End Year</u>				
Farm net worth	\$1,134,504	\$1,249,460	\$1,271,138	\$1,462,927
Change in net worth with appreciation	\$171,007	\$129,660	\$16,515	\$179,895
Debt to asset ratio	0.41	0.41	0.40	0.40
Farm debt per cow	\$2,671	\$2,720	\$2,732	\$2,747

Farms participating in the DFBS each of the last 10 years have increased size of business, labor efficiency and milk sold per cow (Table 7-8). All measures of profitability exhibit wide variability from year-to-year and are highly correlated with milk price received.

TABLE 7-8. COMPARISON OF FARM BUSINESS SUMMARY DATA (Continued)					
Same 54 New York Dairy Farms, 1998 - 2007					
2002	2003	2004	2005	2006	2007
\$12.96	\$13.24	\$16.57	\$16.04	\$13.89	\$20.35
369	389	400	412	425	426
287	302	312	333	346	351
84,823	88,895	90,308	96,441	98,595	99,037
8.55	9.08	9.46	9.58	9.58	9.79
726	760	815	844	873	884
22,960	22,824	22,576	23,426	23,218	23,230
3.4	3.2	3.5	3.6	3.3	3.2
16	18	18	19	19	19
43	43	42	43	44	44
992,087	979,019	954,629	1,006,688	1,029,179	1,011,610
30%	30%	27%	26%	30%	25%
\$4.77	\$5.01	\$5.26	\$5.18	\$5.05	\$6.23
\$11.15	\$11.49	\$12.45	\$12.17	\$12.17	\$14.23
\$14.20	\$14.30	\$15.36	\$15.22	\$15.19	\$17.51
\$2.66	\$2.68	\$2.80	\$2.69	\$2.72	\$2.90
\$0.61	\$0.53	\$0.55	\$0.61	\$0.79	\$0.80
\$1,292	\$1,255	\$1,322	\$1,379	\$1,519	\$1,519
\$11,031	\$16,173	\$14,146	\$14,649	\$9,705	\$13,173
\$14,918	\$15,252	\$18,632	\$15,401	\$23,678	\$4,691
\$6,738	\$6,589	\$6,874	\$7,281	\$7,515	\$8,175
\$1,279	\$1,227	\$1,263	\$1,345	\$1,378	\$1,495
\$2,527	\$2,496	\$2,572	\$2,653	\$2,765	\$2,940
\$1,779	\$1,773	\$1,851	\$1,961	\$2,053	\$2,236
0.54	0.56	0.66	0.63	0.54	0.70
\$32,484	\$44,235	\$255,811	\$241,313	\$43,061	\$471,387
\$83,116	\$107,244	\$374,740	\$356,409	\$125,186	\$643,289
-\$26,854	-\$21,676	\$111,819	\$92,100	-\$38,968	\$221,206
1.3%	2.9%	19.2%	15.4%	2.7%	25.0%
2.8%	3.5%	13.1%	11.5%	4.1%	18.5%
0.8%	1.2%	8.7%	7.7%	1.5%	13.6%
\$1,446,864	\$1,486,533	\$1,752,054	\$1,991,647	\$2,005,569	\$2,516,182
-\$27,066	\$35,852	\$278,514	\$246,462	\$13,631	\$496,199
0.42	0.44	0.39	0.36	0.39	0.33
\$2,817	\$2,942	\$2,766	\$2,713	\$2,908	\$2,858

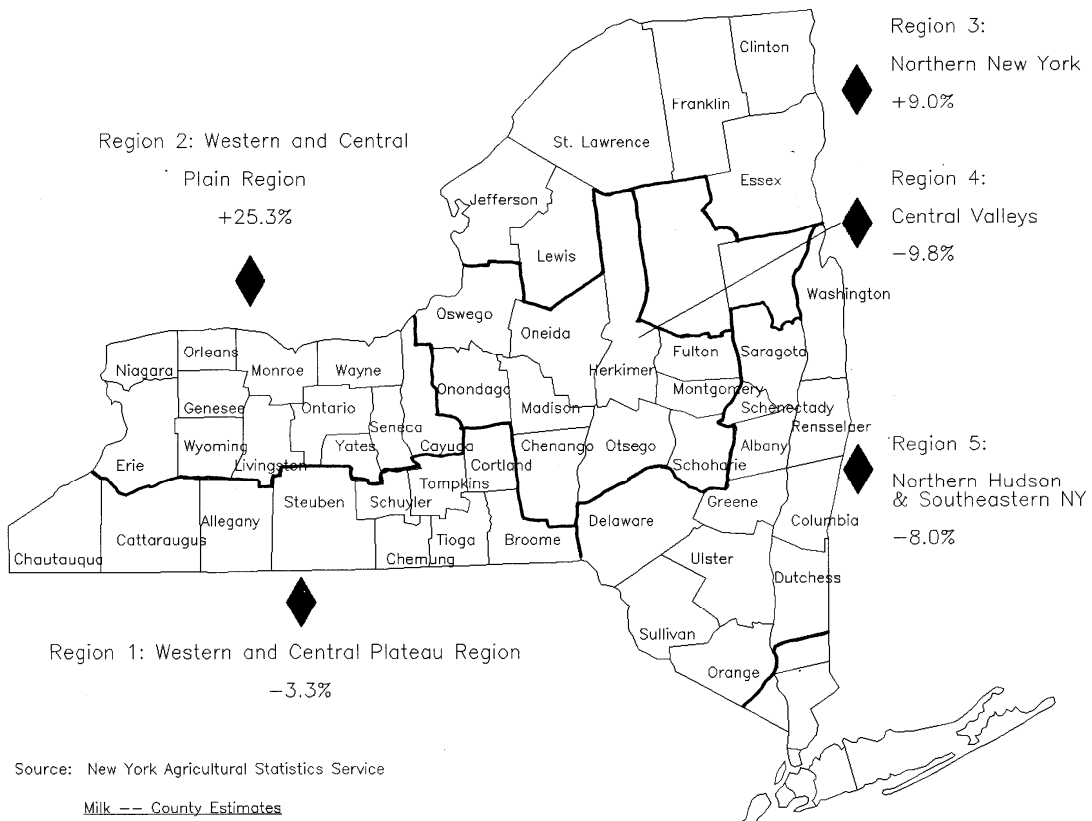
Debt to asset ratio and debt per cow have remained stable while farm net worth more than doubled. During this time, crop yields have fluctuated, largely due to weather. Purchased grain and concentrate as a percent of milk sales varied only from 24 to 30 percent, with the high in 2002, 2003 and 2006, and the low in 1999.

**TABLE 7-9. COMPARISON OF DAIRY FARM BUSINESS DATA BY REGION**  
**250 New York Dairy Farms, 2007**

Item	Western & Central Plateau Region	Western & Central Plain Region	Northern New York	Central Valleys	Northern Hudson & South- eastern New York
Number of farms	40	64	39	35	72
<b>ACCRUAL EXPENSES</b>					
Hired labor	\$82,457	\$471,796	\$207,807	\$148,298	\$121,207
Feed	192,093	804,541	453,063	321,877	265,544
Machinery	75,554	280,866	160,715	138,013	108,870
Livestock	107,931	507,080	273,697	183,196	161,838
Crops	33,401	133,381	74,889	78,171	48,945
Real estate	33,730	136,709	62,006	55,904	36,785
Other	<u>63,944</u>	<u>262,198</u>	<u>141,715</u>	<u>115,257</u>	<u>76,227</u>
Total Operating Expenses	\$589,110	\$2,596,571	\$1,373,893	\$1,040,717	\$819,415
Expansion livestock	6,936	10,931	19,901	15,247	4,443
Extraordinary expense	793	905	1,236	0	106
Machinery depreciation	41,787	133,505	68,847	53,693	30,501
Building depreciation	<u>16,336</u>	<u>81,329</u>	<u>51,329</u>	<u>28,143</u>	<u>19,210</u>
Total Accrual Expenses	\$654,963	\$2,823,241	\$1,516,205	\$1,137,800	\$873,675
<b>ACCRUAL RECEIPTS</b>					
Milk sales	\$768,738	\$3,178,014	\$1,741,309	\$1,330,254	\$971,254
Livestock	53,753	199,520	117,354	93,670	64,447
Crops	18,638	70,834	60,565	54,502	38,452
Government receipts	13,423	41,204	23,174	23,348	18,131
All other	<u>11,920</u>	<u>54,297</u>	<u>19,577</u>	<u>27,471</u>	<u>17,762</u>
Total Accrual Receipts	\$866,472	\$3,543,869	\$1,961,978	\$1,526,514	\$1,110,046
<b>PROFITABILITY ANALYSIS</b>					
Net farm income (w/o appreciation)	\$211,509	\$720,628	\$455,773	\$388,714	\$236,370
Net farm income (w/ appreciation)	\$268,500	\$1,022,512	\$575,523	\$503,443	\$317,322
Labor & management income	\$151,276	\$558,497	\$338,111	\$291,828	\$157,741
Number of operators	1.46	1.79	1.75	1.76	1.42
Labor & mgmt. income/oper.	\$103,613	\$312,010	\$193,206	\$165,812	\$111,085
<b>BUSINESS FACTORS</b>					
Worker equivalent	4.44	14.36	8.61	6.97	5.87
Number of cows	168	673	372	289	210
Number of heifers	135	537	295	238	175
Acres of hay crops <sup>a</sup>	246	506	444	327	278
Acres of corn silage <sup>a</sup>	111	447	283	206	184
Total tillable acres	417	1,241	848	707	495
Pounds of milk sold	3,727,555	15,816,491	8,680,284	6,404,857	4,636,394
Pounds of milk sold/cow	22,204	23,518	23,313	22,140	22,055
Tons hay crop dry matter/acre	2.4	3.3	3.1	3.2	2.8
Tons corn silage/acre	19.8	18.3	20.9	19.3	18.1
Cows/worker	38	47	43	42	36
Pounds of milk sold/worker	839,382	1,101,363	1,008,456	918,808	789,509
% grain & conc. of milk receipts	24%	23%	23%	23%	27%
Feed & crop expense/cwt. milk	\$6.05	\$5.92	\$6.06	\$6.24	\$6.78
Fertilizer & lime/crop acre	\$39.74	\$46.61	\$28.39	\$39.76	\$40.63
Machinery cost/tillable acre	\$316	\$365	\$302	\$306	\$314

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

**FIGURE 7-1. PERCENT CHANGE IN MILK PRODUCTION  
Five Regions in New York, 1997-2007**



**TABLE 7-10. MILK PRODUCTION & AVERAGE COST OF PRODUCING MILK  
Five Regions of New York**

Item	Region <sup>a</sup>				
	1	2	3	4	5
<b>Milk Production<sup>b</sup></b>	(million pounds)				
1997	2,064.9	3,231.8	2,196.5	2,616.9	1,398.4
2007	1,996.5	4,050.5	2,393.5	2,360.0	1,286.0
Percent change	-3.3%	+25.3%	+9.0%	-9.8%	-8.0%
<b>2007 Cost of Producing Milk<sup>c</sup></b>	(\$ per hundredweight milk)				
Operating cost	\$13.37	\$14.17	\$13.51	\$13.42	\$14.78
Total cost	18.03	17.16	17.04	17.33	18.63
Average price received	20.62	20.09	20.06	20.77	20.95
Return per cwt. to operator labor, management & capital	\$5.50	\$4.53	\$5.09	\$5.98	\$4.94

<sup>a</sup>See Figure 7-1 for region descriptions.

<sup>b</sup>Source: New York Agricultural Statistics Service, Milk-County Estimates.

<sup>c</sup>From Dairy Farm Business Summary data.

## Farm Business Charts

The Farm Business Chart is a tool which can be used in analyzing a business by drawing a line through the figure in each column which represents the current level of management performance. The figure at the top of each column is the average of the top 10 percent of the 250 farms for that factor. The other figures in each column are the average for the second 10 percent, third 10 percent, etc. 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 top 10 percent for any other factor.

The cost control factors are ranked from low to high, but the lowest cost is not necessarily the most profitable. In some cases, the "best" management position is somewhere near the middle or average. Many things affect the level of costs, and must be taken into account when analyzing the factors.

**TABLE 7-11. FARM BUSINESS CHART FOR FARM MANAGEMENT COOPERATORS  
250 New York Dairy Farms, 2007**

Size of Business		Rates of Production				Labor Efficiency	
Worker Equivalent	No. 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
28.1	1,314	32,322,710	26,645	5.2	26	61	1,309,445
17.1	773	18,291,548	24,891	4.0	23	50	1,121,656
11.9	494	11,182,833	23,916	3.5	21	46	1,026,711
8.1	346	7,739,127	23,029	3.1	20	43	943,700
5.2	217	4,765,001	21,916	2.8	19	40	849,317
-----							
4.0	149	2,798,701	20,742	2.6	18	36	764,401
3.2	108	2,051,550	19,708	2.4	17	34	662,962
2.7	80	1,444,394	18,062	2.1	16	30	569,954
2.2	60	1,035,063	15,732	1.8	15	25	454,811
1.6	41	684,234	12,412	1.2	12	20	314,396
Cost Control							
Grain Bought Per Cow	% Grain is of Milk Receipts	Machinery Costs Per Cow	Labor & Machinery Costs Per Cow	Feed & Crop Expenses Per Cow	Feed & Crop Expenses Per Cwt. Milk		
\$515	15%	\$430	\$1,088	\$705	\$4.28		
726	19	551	1,294	948	4.96		
814	20	605	1,373	1,067	5.45		
894	22	648	1,436	1,160	5.77		
991	23	700	1,513	1,262	5.95		
-----							
1,066	25	757	1,595	1,341	6.22		
1,134	26	821	1,693	1,426	6.60		
1,205	27	899	1,817	1,511	7.00		
1,305	29	995	2,020	1,609	7.44		
1,492	35	1,251	2,388	1,831	9.03		

The next section of the Farm Business Chart provides for comparative analysis of the value and costs of dairy production.

The profitability section shows the variation in farm income by decile and enables a dairy farmer to determine where he or she ranks by using several measures of farm profitability. Remember that each column is independently established and the farms making up the top decile in the first column will not necessarily be on the top of any other column. The dairy farmer who ranks at or near the top of most of these columns is in a very enviable position.

<b>TABLE 7-11. (CONTINUED) FARM BUSINESS CHART FOR FARM MANAGEMENT COOPERATORS 250 New York Dairy Farms, 2007</b>						
Milk Receipts Per Cow	Milk Receipts Per Cwt.	Operating Cost Milk Production Per Cow	Operating Cost Milk Production Per Cwt.	Total Cost Milk Production Per Cow	Total Cost Milk Prod. Per Cwt.	
\$5,473	\$22.53	\$1,631	\$9.70	\$2,801	\$14.86	
5,036	21.38	2,096	11.55	3,306	16.34	
4,850	20.97	2,385	12.46	3,536	16.99	
4,689	20.70	2,632	12.97	3,708	17.60	
4,473	20.48	2,812	13.56	3,885	18.16	
-----						
4,247	20.32	2,990	14.03	4,024	18.91	
4,002	20.12	3,139	14.57	4,173	19.99	
3,719	19.87	3,353	15.44	4,351	21.53	
3,252	19.62	3,627	16.41	4,566	23.15	
2,599	19.04	4,077	19.13	5,111	28.29	
Profitability						
Net Farm Income Without Appreciation			Net Farm Income With Appreciation		Labor & Management Income	
Total	Per Cow	Operations Ratio	Total	Per Cow	Per Farm	Per Operator
\$1,658,164	\$1,985	0.37	\$2,258,907	\$2,580	\$1,350,735	\$828,820
881,033	1,602	0.31	1,159,819	2,039	690,457	422,319
593,261	1,424	0.28	786,149	1,861	459,165	250,521
385,119	1,262	0.26	537,897	1,674	267,642	163,957
227,152	1,131	0.23	323,558	1,540	154,444	94,290
-----						
142,549	1,021	0.21	182,217	1,407	91,721	57,044
102,171	909	0.19	131,539	1,231	56,345	42,053
68,086	722	0.16	97,870	987	30,338	23,345
43,034	467	0.11	63,898	733	2,284	1,427
3,007	67	0.01	21,902	280	-41,030	-36,506

### Financial Analysis Chart

The farm financial analysis chart is designed just like the farm business chart on the previous pages and may be used to measure the financial health of the farm business.

TABLE 7-12. FINANCIAL ANALYSIS CHART 250 New York Dairy Farms, 2007							
Liquidity (repayment)							
Planned Debt Payments Per Cow	Available for Debt Service Per Cow	Cash Flow Coverage Ratio	Debt Coverage Ratio	Debt Payments as Percent of Milk Sales	Debt Per Cow	Working Capital as % of Total Expenses	Current Ratio
\$92	\$1,522	6.22	9.80	2%	\$203	55%	36.91
233	1,106	2.82	4.47	6	992	38	5.77
315	977	2.24	3.60	8	1,678	30	4.12
387	881	1.91	3.09	10	2,100	26	3.23
454	813	1.65	2.74	11	2,515	23	2.59
-----							
517	737	1.44	2.29	12	2,881	19	2.21
566	655	1.26	1.88	13	3,265	14	1.83
626	534	1.08	1.60	15	3,711	10	1.52
735	377	0.84	1.11	19	4,170	4	1.07
1,007	-5	-0.08	0.02	28	5,777	-12	0.49
Solvency				Operational Ratios			
Leverage Ratio <sup>a</sup>	Percent Equity	Debt/Asset Ratio		Operating Expense Ratio	Interest Expense Ratio	Depreciation Expense Ratio	
		Current & Intermediate	Long Term				
0.02	98%	0.01	0.00	0.54	0.00	0.02	
0.11	90	0.09	0.00	0.59	0.01	0.03	
0.19	84	0.15	0.01	0.62	0.02	0.04	
0.29	78	0.20	0.10	0.65	0.03	0.05	
0.36	74	0.25	0.21	0.67	0.03	0.05	
-----							
0.45	69	0.29	0.29	0.69	0.04	0.06	
0.54	65	0.34	0.39	0.71	0.05	0.07	
0.67	60	0.42	0.50	0.73	0.05	0.08	
0.94	52	0.53	0.63	0.78	0.06	0.10	
1.68	39	0.70	0.89	0.87	0.09	0.14	
Efficiency (Capital)				Profitability			
Asset Turnover (ratio)	Real Estate Investment Per Cow	Machinery Investment Per Cow	Total Farm Assets Per Cow	Change in Net Worth With Appreciation	Percent Rate of Return with Appreciation on:		
					Equity	Investment <sup>b</sup>	
0.95	\$1,504	\$634	\$5,726	\$1,980,666	55%	29%	
0.78	2,240	876	6,959	969,490	36	24	
0.72	2,696	1,111	7,431	612,376	29	21	
0.68	3,012	1,358	7,894	396,561	23	18	
0.62	3,388	1,559	8,452	238,455	19	15	
-----							
0.57	3,752	1,792	9,113	137,890	14	12	
0.50	4,339	2,003	10,060	98,507	11	10	
0.44	5,105	2,256	11,046	69,452	7	7	
0.37	6,374	2,599	12,687	37,054	3	4	
0.26	10,220	3,766	16,830	-5,198	-7	-2	

<sup>a</sup>Dollars of debt per dollar of equity, computed by dividing total liabilities by total equity.

<sup>b</sup>Return on all farm capital (no deduction for interest paid) divided by total farm assets.

### Prices Paid by New York Dairy Farmers and Values of Inventory Items

The prices dairy farmers pay for a given quantity of goods and services has a major influence on farm production costs. The astute manager will keep close watch on unit costs and utilize the most economical goods and services. The table below shows average prices of selected goods and services used on New York dairy farms.

Year	Mixed Dairy Feed 16% Protein <sup>a</sup> (\$/ton)	Fertilizer, Urea 45-46%N <sup>a</sup> (\$/ton)	Seed Corn, Hybrid <sup>b</sup> (\$/80,000 Kernels)	Diesel Fuel <sup>a</sup> (\$/gallon)	Tractor 50-59 PTO <sup>b</sup> (\$)	Wage Rate All Hired Farm Workers <sup>c</sup> (\$/hour)
1993	171	226	72.70	0.900	19,200	6.76
1994	181	233	73.40	0.853	19,800	6.96
1995	175	316	77.10	0.850	20,100	6.92
1996	226	328	77.70	1.020	20,600	7.19
1997	216	287	83.50	0.960	21,200	7.63
1998	199	221	86.90	0.810	21,800	7.63
1999	175	180	88.10	0.750	21,900	8.12
2000	174	201	87.50	1.270	21,800	8.74
2001	176	270	92.20	1.260	22,000	8.72
2002	178	232	92.00	1.028	21,900	9.26
2003	194	283	102.00	1.516	21,300	9.93
2004	207	299	105.00	1.400	21,500	9.96
2005	190	365	111.00	2.020	23,400	9.88
2006	239	403	118.00	2.355	23,700	10.35
2007	300	480	133.00	3.773	24,300	10.49

SOURCE: NYASS, New York Agricultural Statistics. USDA, NASS, Agricultural Prices.  
<sup>a</sup>Northeast region average. <sup>b</sup>United States average. <sup>c</sup>New York and New England combined.

Inflation, farm profitability, supply and demand all have a direct impact on the inventory values on New York dairy farms. The table below shows year-end (December) prices paid for dairy cows (replacements), an index of these cow prices, an index of new machinery prices (U.S. average), the average per acre value of farmland and buildings reported in January, and an index of the real estate prices.

Year	Dairy Cows		Machinery <sup>a</sup>		Farm Real Estate <sup>b</sup>	
	Value/Head	1977=100	Value/Head	1977=100	Value/Acre	1977=100
1993	1,100	222	235	235	1,237	211
1994	1,100	222	249	249	1,260	215
1995	1,010	204	258	258	1,280	218
1996	1,030	208	268	268	1,260	215
1997	980	198	276	276	1,250	213
1998	1,050	212	286	286	1,280	218
1999	1,250	253	294	294	1,340	228
2000	1,250	253	301	301	1,430	244
2001	1,600	323	312	312	1,520	259
2002	1,400	283	320	320	1,610	274
2003	1,300	263	325	325	1,700	290
2004	1,580	319	351	351	1,780	303
2005	1,690	341	373	373	1,920	327
2006	1,550	313	392	392	2,050	349
2007	1,930	390	412	412	2,220	378

SOURCE: NYASS, New York Agricultural Statistics and New York Crop and Livestock Report. USDA, ASB, Agricultural Prices.  
<sup>a</sup>United States average; 1995 - 2007 are estimated due to discontinuation of 1977=100 series.  
<sup>b</sup>New York average for 2000 - 2007 excludes Native American reservation land.