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Pennsylvania

Dairy

Farm

Business

Analysis

Prepared by the Department of Agricultural Economics and Rural Sociology in cooperation with:

MSc **BUSINESS SERVICES**

PFB Members' Service Corporation • Farm Management Services Department

Part I: Introduction

This publication is based on data provided by the Farm Management Services Division of the Pennsylvania Farm Bureau. The basic data consist of members' production and financial information for all farmers using Farm Bureau member-client records. The Pennsylvania Dairy Farm Business Analysis has been published for 39 years. The format and analysis have been altered over this 39-year period to make the analysis more consistent with farmers' and analysts' needs. This year's format represents a significant change from previous publications. Some reference to earlier publications will be used.

This summary and analysis provides information for various categories of dairy farms and is intended for general use as an aid to decision-making on Pennsylvania dairy farms. As such, the report should be useful to extension agents, individual dairy farmers, and a variety of business, government, and educational professionals.

Records from 681 Pennsylvania dairy farms are summarized in this report. To be included in this analysis, farms were required to have 20 or more dairy cows and to derive at least one-half of gross farm receipts from milk sales. The 681 farms included in this analysis represent a broad range of commercial dairy farms. Forty percent of the farms had milk sales

of less than 17,000 pounds per cow, while 16 percent of the farms reported milk sales of less than 14,000 pounds per cow, the same percentage as in 1999 (Table 1). Twenty-two percent of the farms had fewer than 50 cows, while 53 percent had fewer than 75 cows (Table 2). In general, the data suggest that participants in this survey continue to be represented by farms with relatively small herd sizes. This may be due to the management, labor, and farm unit size (buildings and equipment capacities) of farmers who are attracted to tax and management services provided by the Pennsylvania Farm Bureau.

Part II: Summary of Data

In 2000, the average Pennsylvania dairy farm had 88 cows producing 16,117 hundredweights of milk for sale (Table 1). Both average cow numbers and hundredweights of milk sold increased from their 1999 levels of 87 and 15,962, respectively. The average price received for a hundredweight of milk was \$12.48. The group of farms with more than 250 cows received the highest milk price, \$13.08, while those farms with fewer than 50 cows received the lowest price, \$12.29. The average milk price reflects a drop of 19 percent compared to the average price received in 1999.

Compared to 1999, the farms in this analysis had a smaller percentage of their income from milk sales. On average, 85 percent of farm income is from the sale of milk, compared to an average of 90 percent in 1999. Those farms with higher milk sales per cow and larger herd sizes had a slightly larger percentage of income from the sale of milk. Farms with milk sales of more than 23,000 pounds per cow had 87 percent of income from milk sales and farms with more than 250 cows had 91 percent of income from milk sales. On the other hand, farms with milk sales of less than 14,000 pounds per cow had 82 percent of income from milk sales, the same percentage as farms with less than 50 cows. This indicates that smaller and lower-producing farms are relying more on other sources of income to subsidize their dairy operations. The other enterprises and income sources that make up the balance of gross farm receipts include non-breeding livestock sales, crop sales, custom work, government payments, and other farm income.

Cash income averaged \$237,799, down from \$271,767 in 1999. This decrease in income can be at least partially attributed to the decline in milk prices. Total accrual income averaged \$243,520. Cash operating expenses averaged \$207,014 and accrual expenses averaged \$226,154 for 2000. These values represent 3 and 6 percent decreases, respectively, from the previous year. Purchased feed expense comprised 29 percent of the average cash expenditures, slightly lower than the 30.1 percent of 1999. Hired labor was the next largest cash expenditure, accounting for 9 percent of cash expenses.

Accrual adjustments were used in the whole farm production costs and returns statements (Tables 1 and 2). These adjustments are made to more accurately measure annual receipts, expenses, and profitability. Accrual income adjustments included livestock inventory change, breeding livestock purchases and sales, and accounts receivable change. Accrual expense adjustments included feed inventory change, production supplies inventory change, accounts payable change, and depreciation. Accrual income adjustments for the farms in the survey averaged \$5,721 and accrual expense adjustments averaged \$19,140. Accrual adjustments resulted in an average accrual income per hundredweight of \$15.12 while total accrual expenses per hundredweight averaged \$14.10.

Net farm income is the return to the owner and unpaid family members for their labor, management, and equity. However, net farm income does not represent cash available. Accrual net farm

income averaged \$17,366 for 2000. Net income per hundredweight was \$1.02, a 60 percent decline from 1999. The farms in the category having less than 14,000 pounds of milk sold per cow had the smallest net farm income per hundredweight of \$0.32. Those farms selling more than 23,000 pounds of milk per cow had a net income of \$1.36 per hundredweight, the largest amount of any category in the analysis.

Nonfarm capital contributions increased from \$14,441 in 1999 to \$16,742 in 2000, an increase of 14 percent. Average family living withdrawal declined 7 percent in 2000 to \$44,486. Only \$14,727 was available for principal repayment, less than the \$27,137 annual depreciation.

The average herd size for farms in this survey was 88. Heifers per farm averaged 65, with an average heifer-to-cow ratio of 74 percent (Table 3). Farms with less than 50 cows had the lowest heifer to cow ratio, 69 percent, while farms with a herd size between 150 and 249 cows had a 77 percent ratio. The largest herds had a relatively low ratio of heifers to cows, 71 percent.

Table 1. Whole farm milk production costs and returns by milk sold per cow

	All farms	<14,000	14,000– 16,999	17,000– 19,999	20,000– 22,999	>23,000
Number of farms	681	107	164	202	151	57
Cows per farm	88	71	83	89	98	99
Hundredweights of milk sold	16,117	8,580	13,056	16,509	21,065	24,583
Income						
Milk sales	\$203,288	\$110,047	\$164,139	\$206,312	\$266,552	\$312,648
Milk sales/hundredweight	\$12.48	\$12.47	\$12.43	\$12.41	\$12.57	\$12.65
Nonbreeding livestock sales	\$3,530	\$2,237	\$2,911	\$4,063	\$3,972	\$4,679
Crop sales	\$2,536	\$1,427	\$1,235	\$2,987	\$3,706	\$3,669
Custom work income	\$1,978	\$1,333	\$1,819	\$1,971	\$2,253	\$2,943
Government payments	\$20,246	\$13,794	\$18,246	\$21,894	\$21,503	\$28,946
Other farm income	\$6,220	\$4,699	\$4,444	\$6,433	\$8,305	\$7,903
Total income	\$237,799	\$133,538	\$192,793	\$243,660	\$306,292	\$360,789
Total income/hundredweight	\$14.81	\$15.39	\$14.73	\$14.75	\$14.59	\$14.80
Accrual Income Adjustments						
+Livestock inventory change	\$2,963	\$4,260	\$6,044	\$2,376	\$1,104	\$(1,327)
-Breeding livestock purchases	\$7,657	\$9,949	\$6,560	\$6,896	\$7,784	\$8,872
+Breeding livestock sales	\$11,686	\$6,939	\$9,246	\$11,457	\$15,745	\$17,679
+Accounts receivable change	\$(1,271)	\$(900)	\$(1,612)	\$(120)	\$(1,433)	\$(4,635)
Accrual income adjustment	\$5,721	\$350	\$7,118	\$6,817	\$7,631	\$2,845
Total accrual income	\$243,520	\$133,888	\$199,911	\$250,477	\$313,923	\$363,634
Total accrual income/hundredweight	\$15.12	\$15.24	\$15.22	\$15.15	\$15.00	\$14.86
Expenses						
Milk marketing	\$13,407	\$7,708	\$10,916	\$13,560	\$18,157	\$18,145
Hired labor	\$19,417	\$10,896	\$13,690	\$20,419	\$25,277	\$32,809
Purchased feed	\$60,020	\$35,566	\$48,312	\$61,033	\$78,966	\$85,831
Breeding, testing, and registration	\$4,459	\$2,447	\$3,099	\$4,687	\$5,800	\$7,786
Veterinarian and medicine	\$6,486	\$2,778	\$4,452	\$6,640	\$8,995	\$12,109
Poultry and livestock	\$180	\$335	\$28	\$122	\$382	\$—
Poultry and livestock supplies	\$9,356	\$5,106	\$6,797	\$10,045	\$11,896	\$15,524
Crop seed and supplies	\$12,825	\$7,716	\$10,664	\$13,392	\$15,480	\$19,595
Fertilizer and lime	\$6,257	\$3,518	\$5,615	\$6,768	\$7,366	\$8,497
Custom work	\$6,177	\$2,978	\$3,601	\$6,311	\$9,431	\$10,495
Machinery repairs	\$12,699	\$8,319	\$11,159	\$13,326	\$14,745	\$17,712
Truck and automobile (farm share)	\$1,512	\$1,076	\$1,380	\$1,672	\$1,658	\$1,753
Gas and oil (fuel)	\$7,015	\$4,905	\$6,800	\$7,490	\$7,592	\$8,379
Building repair	\$3,752	\$1,635	\$3,408	\$3,697	\$4,768	\$6,219
Utilities	\$6,451	\$4,632	\$5,628	\$6,523	\$7,394	\$9,487
Rent	\$10,242	\$5,762	\$9,181	\$8,785	\$14,916	\$14,483
Taxes	\$3,856	\$3,278	\$3,549	\$3,770	\$4,248	\$5,090
Insurance	\$5,103	\$3,547	\$4,843	\$5,156	\$5,476	\$7,594
Interest	\$13,007	\$9,001	\$11,483	\$12,993	\$15,946	\$17,176
Miscellaneous	\$4,794	\$2,851	\$4,077	\$4,785	\$6,044	\$7,218
Total expenses	\$207,014	\$124,053	\$168,680	\$211,176	\$264,537	\$305,901
Total expenses/hundredweight	\$12.87	\$14.10	\$12.80	\$12.68	\$12.48	\$12.52
Accrual Expense Adjustments						
-Feed inventory change	\$9,163	\$8,359	\$7,602	\$9,650	\$9,031	\$13,782
-Production supplies inventory change	\$(867)	\$(146)	\$(1,259)	\$(773)	\$(2,230)	\$2,191
+Accounts payable change	\$300	\$176	\$470	\$208	\$538	\$(267)
+Depreciation	\$27,137	\$15,375	\$22,437	\$29,124	\$33,336	\$39,273
Total accrual expense adjustments	\$19,140	\$7,339	\$16,564	\$20,455	\$27,073	\$23,034
Total accrual expenses	\$226,154	\$131,392	\$185,244	\$231,631	\$291,609	\$328,935
Total accrual expenses/hundredweight	\$14.10	\$14.92	\$14.16	\$13.99	\$13.82	\$13.50

Table 1. continued

	All farms	<14,000	14,000– 16,999	17,000– 19,999	20,000– 22,999	>23,000
Net Farm Income						
Accrual net farm income	\$17,366	\$2,497	\$14,667	\$18,846	\$22,313	\$34,699
Accrual net farm income/hundredweight	\$1.02	\$0.32	\$1.06	\$1.16	\$1.18	\$1.36
Cash Flow Summary						
Cash flow from farm operations	\$237,799	\$133,538	\$192,793	\$243,660	\$306,292	\$360,789
+Breeding livestock sales	\$11,686	\$6,939	\$9,246	\$11,457	\$15,745	\$17,679
-Cash farm expenses	\$207,014	\$124,053	\$168,680	\$211,176	\$264,537	\$305,901
+Nonfarm capital contributions	\$16,742	\$29,392	\$14,719	\$16,922	\$10,430	\$14,893
-Family living withdrawal	\$44,486	\$30,848	\$38,837	\$45,847	\$51,066	\$64,082
Amount available for principal repayment	\$14,727	\$14,968	\$9,242	\$15,016	\$16,863	\$23,378

In this summary, one worker equivalent is defined as 60 work hours per week. This includes both unpaid family and hired labor. Worker equivalents per farm increased as herd size increased. The average number of worker equivalents was 2.34, with an average of 39 cows per worker equivalent (Table 3). Crop acres, pounds of milk sold (total and per cow), and net farm income tended to increase with herd size. While the average net farm income was \$17,366, farms with more than 250 cows averaged \$88,671 in net farm income. These farms in the largest herd size category had a net farm income five times higher than the average. While not having the highest net income per hundredweight, the farms with more than 250 cows were able to accrue the largest net farm income due to their relatively high-producing herds.

Assets based on market values have been used to calculate return on assets and equity, and capital turnover (in years). In 2000, average total farm assets, by category, ranged in value from \$191,459 to \$1,516,096 (Table 4). Rate of return on farm assets (ROA) was calculated by using the following equation:

$$\frac{(\text{net farm income} + \text{interest} - \text{family withdrawal})}{\text{total farm assets}}$$

ROA is a financial ratio that is commonly used as an indicator of profitability by measuring the amount of profit generated by farm labor, management, and capital.

Average ROA for all farms was -4.7 percent.

Rate of return on equity (ROE) was calculated using the following equation:

$$\frac{(\text{net farm income} - \text{family withdrawal})}{\text{net worth (equity)}}$$

ROE is also used as a measure of profitability, measuring the profit generated by the owner's equity. Farms with more than 250 cows had the largest total debt as well as the lowest rate of return on equity. Asset, or capital, turnover was calculated by dividing milk income by total asset value. This ratio is used to determine financial efficiency by measuring how efficient the farm is in converting assets into product sales. Pennsylvania dairy farms averaged 2.32 years (based on current year sales) to generate the sales needed to equal the current value of farm assets. The largest group of farms had an average capital turnover of 1.72 years, meaning that 1.72 years of sales would equal the current value of farm assets.

Net income per cow averaged \$193, ranging from an average of \$140 on farms with 150 to 249 cows to \$260 on farms with more than 250 cows (Table 5). Bushels of corn harvested per acre generally increased with an increase in herd size, with the exception of the farms with more than 250 cows, which averaged 119 bushels per acre. The overall average for the farms in the survey was 123

bushels per acre. The average amount of corn silage per acre was 18.8 tons, with tonnage increasing with herd size. Tons of hay equivalent per acre and crop value per acre generally increased with herd size, with averages of 3.3 tons and \$311 respectively.

Averages for bushels of corn per acre, tons of corn silage per acre, tons of hay equivalent per acre, and crop value per acre all exceeded the values for 1999. Net income per cow, however, averaged 58 percent less than the previous year, \$193 compared to \$464 in 1999.

While farms with higher production per cow had a higher total worker equivalent, the number of cows per worker equivalent remained generally the same across categories of productivity (Table 6). Additionally, farms with more than 23,000 pounds of milk sold per cow had the fewest number of cows per worker equivalent, 36, while the average number of cows per worker equivalent was 39. Pounds of milk sold per worker equivalent increased with the increase of milk sold per cow, with an average of 707,053 pounds sold. Both total net farm income and net farm income per worker equivalent increased with the rise in milk sold per cow.

Table 2. Whole farm milk production costs and returns

	Herd size						
	All Herds	<50	50-74	75-99	100-149	150-249	>250
Number of farms in sample	681	149	215	125	120	58	14
Number of cows per farm	88	39	61	84	119	187	361
Hundredweights of milk sold	16,117	6,434	10,917	15,774	22,147	35,563	69,857
Income							
Milk sales	\$203,288	\$79,394	\$135,077	\$196,957	\$281,981	\$454,054	\$912,515
Milk sales/cwt of milk	\$12.48	\$12.29	\$12.34	\$12.48	\$12.72	\$12.80	\$13.08
Nonbreeding livestock sales	\$3,530	\$2,374	\$2,845	\$3,675	\$4,164	\$5,536	\$11,302
Crop sales	\$2,536	\$1,336	\$1,086	\$3,089	\$3,659	\$6,509	\$6,571
Custom work income	\$1,978	\$817	\$1,412	\$1,986	\$4,051	\$2,786	\$1,854
Government payments	\$20,246	\$8,342	\$14,344	\$21,678	\$26,480	\$47,627	\$57,941
Other farm income	\$6,220	\$4,086	\$3,841	\$6,335	\$7,659	\$15,409	\$14,036
Total income	\$237,799	\$96,348	\$158,606	\$233,721	\$327,994	\$531,921	\$1,004,219
Total income/hundredweight of milk	\$14.81	\$15.06	\$14.55	\$14.85	\$14.87	\$15.02	\$14.40
Income Adjustments							
+ Livestock inventory change	\$2,963	\$133	(\$1,489)	\$4,271	\$6,956	\$9,540	\$28,325
- Breeding livestock purchases	\$7,657	\$2,724	\$4,825	\$4,921	\$12,976	\$17,057	\$43,556
+ Breeding livestock sales	\$11,686	\$5,261	\$8,633	\$11,106	\$15,894	\$25,356	\$39,442
+ Accounts receivable change	(\$1,271)	(\$203)	(\$1,044)	(\$1,414)	(\$1,660)	(\$3,095)	(\$3,952)
Net income adjustment	\$5,721	\$2,466	\$1,275	\$9,043	\$8,213	\$14,744	\$20,259
Total adjusted income	\$243,520	\$98,814	\$159,881	\$242,763	\$336,208	\$546,665	\$1,024,478
Total accrual income/hundredweight	\$15.12	\$15.32	\$14.65	\$15.42	\$15.32	\$15.44	\$14.72
Expenses							
Milk marketing expense	\$13,407	\$5,655	\$9,392	\$13,621	\$18,665	\$28,067	\$49,840
Hired labor	\$19,417	\$3,816	\$8,831	\$17,319	\$26,855	\$61,567	\$128,377
Feed purchased	\$60,020	\$24,459	\$42,178	\$55,866	\$85,025	\$123,203	\$273,516
Breeding testing registration	\$4,459	\$2,021	\$3,225	\$4,720	\$5,990	\$8,885	\$15,561
Vet and medicine	\$6,486	\$2,575	\$3,892	\$5,981	\$8,741	\$17,077	\$29,257
Poultry and livestock purchases	\$180	\$335	\$91	\$11	\$274	\$322	\$0
Poultry and livestock supplies	\$9,356	\$3,923	\$5,890	\$9,532	\$13,501	\$19,688	\$40,494
Crop seed and supplies	\$12,825	\$4,618	\$7,783	\$13,319	\$16,780	\$33,248	\$54,695
Fertilizer and lime	\$6,257	\$2,924	\$4,208	\$6,021	\$8,065	\$16,826	\$16,016
Custom work hired	\$6,177	\$2,071	\$3,609	\$6,691	\$8,745	\$13,189	\$33,646
Machinery repair	\$12,699	\$5,533	\$9,377	\$13,461	\$16,624	\$27,123	\$39,783
Truck and auto (farm share)	\$1,512	\$876	\$1,293	\$1,624	\$1,633	\$3,148	\$2,816
Gas and oil (fuel)	\$7,015	\$3,467	\$5,085	\$7,240	\$8,997	\$15,323	\$20,994
Building repair	\$3,752	\$1,378	\$2,516	\$3,177	\$4,906	\$9,676	\$18,685
Utilities	\$6,451	\$3,541	\$5,014	\$6,586	\$8,325	\$12,308	\$17,979
Rent	\$10,242	\$2,599	\$4,971	\$9,711	\$14,886	\$32,381	\$45,749
Taxes	\$3,856	\$2,271	\$3,216	\$4,119	\$4,669	\$6,681	\$9,543
Insurance	\$5,103	\$2,413	\$3,371	\$4,910	\$6,447	\$12,338	\$20,566
Interest	\$13,007	\$4,294	\$9,997	\$13,729	\$19,813	\$25,938	\$33,613
Misc expenses	\$4,794	\$2,331	\$2,876	\$4,472	\$7,415	\$11,449	\$13,278
Total expenses	\$207,014	\$81,101	\$136,812	\$20,211	\$286,355	\$478,437	\$864,408
Total expenses/hundredweight	\$12.87	\$12.84	\$12.63	\$12.95	\$13.02	\$13.51	\$12.44
Expense Adjustments							
- Feed inventory change	\$9,163	\$3,145	\$6,051	\$8,345	\$12,642	\$25,487	\$30,836
- Production supplies inventory change	(\$867)	(\$22)	\$301	(\$938)	(\$1,480)	(\$4,817)	(\$5,518)
+ Accounts payable change	\$1,678	\$843	\$1,121	\$2,348	\$1,271	\$3,983	\$7,103
+ Depreciation	\$27,137	\$11,259	\$19,626	\$28,805	\$36,396	\$57,871	\$89,874
Total accrual expense adjustments	\$19,140	\$8,163	\$12,980	\$21,258	\$25,545	\$39,748	\$71,399
Total accrual adjusted expenses	\$226,154	\$89,264	\$149,792	\$223,368	\$311,900	\$518,186	\$935,807
Total accrual expenses/hundredweight	\$14.10	\$14.10	\$13.83	\$14.25	\$14.25	\$14.60	\$13.54

Table 2. continued

	Herd size						
	All Herds	<50	50–74	75–99	100–149	150–249	>250
Farm Income							
Net farm income	\$17,366	\$9,550	\$10,089	\$19,395	\$24,308	\$28,479	\$88,671
Accrual net farm income/hundred-weight	\$1.02	\$1.21	\$0.82	\$1.17	\$1.07	\$0.84	\$1.19
Cash Flow Summary							
Cash flow from farm operations	\$237,799	\$96,348	\$158,606	\$233,721	\$327,994	\$531,921	\$1,004,219
+ Breeding livestock sales	\$11,686	\$5,261	\$8,633	\$11,106	\$15,894	\$25,356	\$39,442
- Cash farm expenses	\$207,014	\$81,101	\$136,812	\$202,110	\$286,355	\$478,437	\$864,408
+ Nonfarm capital contributions	\$16,742	\$16,234	\$15,751	\$19,643	\$15,147	\$15,264	\$31,226
- Family living withdrawal	\$44,486	\$30,787	\$33,468	\$46,661	\$56,752	\$68,940	\$133,602
Amount available for principal repayment	\$14,727	\$5,954	\$12,709	\$15,699	\$15,929	\$25,164	\$76,877

Table 3. Summary production and efficiency measures by herd size

Categories of farms based on herd size	Cows per farm	Heifers per farm	Ratio of heifers to cows	Total worker equivalent per farm	Cows per worker equivalent	Crop acres	Lbs. of milk sold	Lbs. of milk sold per cow	Net farm income
<50	39	27	69%	1.48	29	113	643,395	16,640	\$9,550
50–74	61	47	76%	1.86	37	145	1,091,690	17,856	\$10,089
75–99	84	61	72%	2.21	42	212	1,577,421	18,689	\$19,395
100–149	119	91	76%	2.94	48	275	2,214,731	18,557	\$24,308
150–249	187	145	77%	4.40	48	515	3,556,345	19,115	\$28,479
>250	361	259	71%	6.33	66	633	6,985,734	19,572	\$88,671
All herds	88	65	74%	2.34	39	215	1,611,737	18,009	\$17,366

Note: one worker equivalent = 60 hours per week. Includes both unpaid family and hired labor.

Table 4. Total farm investment, percent return, capital turnover, and net farm income by herd size

Categories of farms based on herd size	Total farm assets	Rate of return on farm assets	Total farm debt	Net worth	Rate of return on farm equity	Capital turnover (years)	Net farm income
<50	\$191,459	-8.80%	\$70,681	\$121,621	-12.40%	2.59	\$9,550
50–74	\$309,297	-5.20%	\$147,812	\$162,605	-13.80%	2.33	\$10,089
75–99	\$420,596	-3.50%	\$197,998	\$224,945	-7.70%	2.22	\$19,395
100–149	\$593,953	-2.50%	\$296,361	\$298,863	-5.70%	2.16	\$24,308
150–249	\$987,750	-1.00%	\$399,254	\$592,480	-7.40%	2.20	\$28,479
>250	\$1,516,096	0.30%	\$526,811	\$996,388	-3.50%	1.72	\$88,671
All herds	\$436,696	-4.70%	\$195,531	\$242,844	-10.10%	2.32	\$17,366

Note the following definitions:

Rate of return on farm assets = (net farm income + farm interest expenses – family living withdrawal)/total farm assets

Rate of return on farm equity = (net farm income – family living withdrawal)/total farm equity

Capital turnover = total farm assets/gross revenue

Table 5. Efficiency measures and net dairy income per cow by herd size

Categories of farms based on herd size	Lbs. milk sold per cow	Net income per cow	Bushels of corn harvested per acre	Tons of corn silage per acre	Tons of hay equiv. per acre	Crop value per crop acre
<50	16,640	\$217	110	16.7	3.1	\$260
50–74	17,856	\$156	117	17.9	3.4	\$308
75–99	18,689	\$230	129	18.7	3.5	\$318
100–149	18,557	\$208	131	20.6	3.5	\$342
150–249	19,115	\$140	136	21.4	3.0	\$334
>250	19,572	\$260	119	22.0	3.6	\$372
All herds	18,009	\$193	123	18.8	3.3	\$311

Table 6. Herd size, labor efficiency, and income by milk sold per cow

Milk sold per cow	Number of cows	Total WE	Lbs of milk sold	Cows per WE	Lbs. of milk sold/WE	Net farm income	Net farm income/WE
<14,000	71	1.90	858,009	40	470,753	\$2,497	\$1,996
14,000–16,999	83	2.17	1,305,581	39	615,059	\$14,667	\$7,920
17,000–19,999	89	2.44	1,650,851	39	725,067	\$18,846	\$8,140
20,000–22,999	98	2.51	2,106,467	41	875,315	\$22,313	\$11,785
>23,000	99	2.81	2,458,283	36	905,727	\$34,699	\$14,653
All farms	88	2.34	1,611,737	39	707,053	\$17,366	\$8,475

Note: WE = one worker equivalent

Table 7. Purchased feed cost and net income by milk sold per cow

Milk sold per cow	Net farm income/cow	Purchased feed/cwt	Purchased feed/cow	Purchased feed as % of milk sales
<14,000	\$39.41	\$4.10	\$482.92	33%
14,000–16,999	\$161.04	\$3.76	\$591.54	30%
17,000–19,999	\$216.14	\$3.69	\$683.74	30%
20,000–22,999	\$249.97	\$3.78	\$810.36	30%
>23,000	\$339.54	\$3.51	\$890.19	28%
All farms	\$192.93	\$3.78	\$675.34	30%

The data show that purchased feed was by far the largest expense category. Purchased feed cost per hundredweight of milk sold generally declined with increased productivity. However, purchased feed cost per cow increased as production rose. The average cost per hundredweight was \$3.78 and the average cost per cow was \$675.34 (Table 7). As a percentage of milk sales, purchased feed cost declined on farms with greater levels of production per cow. Purchased feed accounted for 33 percent of milk sales on farms with less than 14,000 pounds of milk sold per cow, while only accounting for 28 percent of milk sales on farms with more than 23,000 pounds sold per cow. The average purchased feed expense as a percentage of milk sales was 30 percent, 4 percentage points higher than in 1999.

Table 8 examines purchased feed and labor expense and net farm income by cash cost per hundredweight of milk produced. 62.7 percent of farms had a cash cost per hundredweight that exceeded \$13. Only 19.7 percent of the farms in this year's survey had cash costs per hundredweight of less than \$12. In contrast, 56.8 percent of farms in 1999's survey had cash costs per hundredweight of less than \$12. Purchased feed cost per hundredweight and per cow generally increased as total cash cost per hundredweight increased.

However, it reached a peak for farms with a cash cost between \$14.00 – \$14.99. Purchased feed expense as a percentage of milk sales generally increased as well, averaging 30 percent. Labor cost per cow ranged from \$75.99 to \$249.58, with an average of \$177.92. The data show that, with lower cash costs per hundredweight, net farm income per cow is higher. The average net farm income per cow was \$192.93. Only farms with a total cash cost greater than \$15.99 had an average net loss per cow.

The relationship between acreage, herd size, and labor employed is shown in Table 9. Forage crops dominated land use. On average, 144 of 215 acres were used for forage purposes. Grain crops were the second most important use of land. On farms with less than 150 cows, unpaid family labor constituted the majority of labor. On the other hand, more than 50 percent of labor was hired on farms with more than 250 cows.

Although total farm assets per cow remained generally the same between herd size categories, total assets per worker equivalent increased as herd size increased (Table 10). The average market value of land and buildings per cow was \$4,493, decreasing from \$4,976 for herds of less than 50 cows to \$2,100 for herds of more than 250 cows.

Machinery assets per cow also decreased as herd size increased. The value of land and buildings per worker equivalent was greatest for farms with 75 to 99 cows. Machinery assets per worker equivalent, however, generally increased as herd size grew.

Table 11 shows machinery and labor costs as they relate to herd size (labor costs do not include family withdrawal). Machinery expense per hundredweight of milk was greatest for farms with less than 50 cows. However, these farms had the lowest labor costs, both on a per hundredweight and per cow basis. The group of farms with the lowest machinery expense per hundredweight and highest labor expense per hundredweight and per cow were those with more than 250 cows. The average machinery expense per hundredweight of milk was \$0.85. The average labor costs per hundredweight and per cow were \$0.98 and \$178, respectively.

Table 8. Purchased feed, labor cost, and farm income by cash cost per hundredweight

Cash cost/cwt	Number of farms	Number of cows	Purchased feed		As % of milk sales	Labor cost/cow	Net farm income/cow
			Per hundredweight	Per cow			
<\$10.00	30	61	\$3.13	\$587.39	26%	\$75.99	\$1,207.26
\$10.00–\$10.99	41	75	\$3.19	\$574.11	26%	\$96.40	\$684.84
\$11.00–\$11.99	63	81	\$3.54	\$657.60	29%	\$115.31	\$516.32
\$12.00–\$12.99	110	97	\$3.49	\$648.54	28%	\$141.38	\$379.16
\$13.00–\$13.99	117	94	\$4.01	\$735.60	32%	\$163.93	\$212.24
\$14.00–\$14.99	109	95	\$4.07	\$740.90	33%	\$209.63	\$101.33
\$15.00–\$15.99	68	83	\$3.91	\$674.16	32%	\$211.74	\$6.85
>\$15.99	143	84	\$3.92	\$652.53	31%	\$249.58	(\$304.12)
All farms	681	88	\$3.78	\$675.34	30%	\$177.92	\$192.93

Table 12 shows that machinery expense per hundredweight decreased as milk sold per cow increased. Machinery expense per cow, however, increased with an increase in milk sold per cow. Labor cost per cwt was relatively stable across production categories, while labor cost per cow increased as milk sold per cow increased.

A balance sheet, categorized by farm size, is shown in Table 13. Total assets

averaged \$595,316 and total liabilities averaged \$195,531 for all the farms in the survey. Both assets and liabilities increased as herd size increased. The majority of asset value lay in land for farms with less than 250 cows. For those farms with more than 250 cows, the market value of buildings, machinery and equipment, and livestock were each higher than the value of land. Average equity in farms was \$399,786.

The number of farms was evenly distributed across the number of years for capital turnover (Table 14). Total assets per cow and per worker equivalent each increase as the years for capital turnover increase. Total net farm income per worker equivalent decreased though as capital turnover increased. This value ranged from \$6,304 for farms with the highest number of years for turnover, to \$10,835 for farms with a capital turnover of less than 1.5 years.

Table 9. Acreage and labor force (worker equivalent)

	Categories of farms based on herd size						All herds
	<50	50–74	75–99	100–149	150–249	>250	
Land (acres)							
Forage crops	79	104	142	186	313	403	144
Feed grains	27	33	55	73	136	202	55
Cash crops	12	17	21	28	83	73	26
Double crops	5	9	6	12	17	45	10
Total acres	113	145	212	275	515	633	215
Labor (worker equiv.)							
Unpaid family							
labor	1.25	1.41	1.54	1.67	1.66	2.01	1.48
Hired labor	0.23	0.45	0.66	1.27	2.74	4.32	0.86
Total labor	1.48	1.86	2.21	2.94	4.40	6.33	2.34

Table 10. Assets and market values per cow and worker equivalent

Categories of farms based on herd size	Total farm assets per cow	Total assets per worker equivalent	Market value of land and buildings per cow	Value of land and buildings per worker equivalent	Machinery assets per cow	Machinery assets per worker equivalent	Capital turnover (years)
<50	\$5,045	\$138,490	\$4,976	\$131,398	\$1,821	\$49,345	2.59
50–74	\$5,048	\$183,111	\$4,834	\$171,078	\$1,585	\$55,783	2.33
75–99	\$4,966	\$205,625	\$4,738	\$186,473	\$1,576	\$65,445	2.22
100–149	\$4,996	\$236,662	\$3,750	\$171,687	\$1,412	\$65,566	2.16
150–249	\$5,286	\$244,700	\$3,573	\$163,947	\$1,340	\$61,389	2.20
>250	\$4,405	\$291,107	\$2,100	\$140,822	\$999	\$67,595	1.72
All herds	\$5,030	\$194,382	\$4,493	\$164,100	\$1,572	\$58,592	2.32

Note: Capital turnover = total farm assets/gross revenue

Table 11. Machinery and labor costs by farm size

Categories of farms based on herd size	Cows per farm	Cwt of milk sold	Machinery expense per cwt of milk	Labor cost per cwt of milk	Labor cost per cow
<50	39	6,434	\$0.92	\$0.62	\$101
50–74	61	10,917	\$0.87	\$0.77	\$140
75–99	84	15,774	\$0.89	\$1.10	\$201
100–149	119	22,147	\$0.76	\$1.20	\$224
150–249	187	35,563	\$0.77	\$1.72	\$332
>250	361	69,857	\$0.56	\$1.82	\$342
All herds	88	16,117	\$0.85	\$0.98	\$178

Note: labor costs do not include family withdrawal

Table 12. Machinery, labor costs, and milk sales by milk sold per cow

Milk sold per cow	Number of cows	Lbs of milk sold	Machinery expense/cwt	Machinery expense/cow	Labor cost/cwt	Labor cost/cow
<14,000	71	858,009	\$1.04	\$121.17	\$1.02	\$121.60
14,000–16,999	83	1,305,581	\$0.90	\$142.03	\$0.81	\$128.17
17,000–19,999	89	1,650,851	\$0.83	\$153.99	\$1.02	\$189.98
20,000–22,999	98	2,106,467	\$0.73	\$156.02	\$1.00	\$214.96
>23,000	99	2,458,283	\$0.74	\$187.56	\$1.14	\$285.98
All farms	88	1,611,737	\$0.85	\$149.21	\$0.98	\$177.92

Note: labor costs do not include family withdrawal

Table 13. Farm balance sheet (market value)

	<50	50–74	75–99	100–149	150–249	>250	All herds
Assets							
Land	\$121,676	\$181,312	\$245,039	\$247,508	\$363,581	\$319,936	\$209,999
Buildings	\$64,690	\$111,295	\$155,825	\$195,661	\$297,462	\$378,228	\$145,481
Mach. and equip.	\$69,397	\$96,479	\$133,590	\$166,764	\$250,340	\$328,697	\$127,629
Livestock	\$60,435	\$99,808	\$134,691	\$192,404	\$305,984	\$545,574	\$140,637
Inventory	\$21,943	\$37,616	\$55,103	\$76,748	\$139,754	\$177,125	\$55,859
Cash	\$26,071	\$26,459	\$28,856	\$28,857	\$79,746	\$96,317	\$33,211
Notes and accts receivable	\$2,568	\$5,610	\$10,699	\$13,426	\$25,180	\$64,314	\$10,129
Total assets	\$297,383	\$462,099	\$630,213	\$754,604	\$1,211,707	\$1,581,494	\$595,316
Liabilities							
Mortgage	\$42,605	\$93,471	\$118,137	\$157,546	\$231,423	\$340,346	\$114,984
Notes payable	\$27,233	\$53,221	\$77,514	\$137,544	\$163,847	\$179,362	\$78,868
Accounts payable	\$843	\$1,121	\$2,348	\$1,271	\$3,983	\$7,103	\$1,678
Total debt	\$70,681	\$147,812	\$197,998	\$296,361	\$399,254	\$526,811	\$195,531
Equity	\$226,702	\$314,287	\$432,215	\$458,243	\$812,453	\$1,054,683	\$399,786
Equity as % of assets	70%	64%	63%	59%	64%	63%	64%

Note: totals may not add up due to rounding.

Table 14. Total assets and total farm income by years for capital turnover

Years for capital turnover	Number of farms	Number of cows	Total assets/cow	Total assets/WE	Total net farm income/WE
<1.50	153	92	\$2,985	\$118,136	\$10,835
1.50–1.99	167	93	\$3,953	\$155,870	\$11,371
2.00–2.49	130	91	\$4,987	\$196,218	\$7,541
2.50–2.99	106	86	\$6,121	\$243,617	\$6,304
All farms	681	88	\$5,030	\$194,382	\$8,475

Note: WE = one worker equivalent

Part III: Analysis

It is helpful to place the 2000 data in a historical context. In so doing, we can analyze how Pennsylvania dairy farmers are performing relative to past years. This section provides a more-thorough analysis of dairy farm profitability and efficiency in 2000 and how these data compare to recent history. We used data from the 1996 to 1999 editions of the *Pennsylvania Dairy Farm Business Analysis*.

Farm Profitability

The average farm in each size category maintained positive profit levels in 2000 (Figure 1). Accrual net income levels range from just under \$10,000 for the smallest farms to nearly \$89,000 for the largest. However, these figures do not take family living expenses into account. A farm that is to be viable in the long run must generate adequate returns to cover operating expenses, capital replacement, and farm family living expenses. In each size category, the average farm drew more than their net income for family expenses.

This represents a likely decrease in farm equity.

There are several alternative measures of farm business profitability. Obviously, net income is the most direct measure. However, this measure is very dependent upon farm size. Therefore, it is difficult to compare farms across size categories. We will discuss one alternative, return on assets, which allows for a comparison across farms of all sizes.

The rate of return on farm assets (ROA) shows the percentage return to all assets invested in the dairy operation. This includes both equity and debt assets. Again, it is calculated as follows:

$$\frac{(\text{net farm income} + \text{interest expense} - \text{family draw})}{\text{total farm assets}}$$

Interest expense is added back into net farm income because it represents a return to those assets owned by creditors. Family draw is removed since it represents a draw

on farm income. Remember, family living expenses are subtracted from net farm business income when calculating ROA. This accounts for the fact that while all farm size categories had positive net farm incomes, all but one category had a negative return on farm assets.

The average ROA in all but the largest size category was negative in 2000, with the smallest farms realizing the worst returns (Figure 2). Farms with more than 250 cows generated a 0.3 percent return on farm assets. This means that each \$100 of assets invested in the farm business generated a return of \$0.30. For the smallest farms, about \$8.80 was lost for each \$100 invested in farm assets. Again, the low milk price was the leading cause of poor financial performance on Pennsylvania dairy farms in 2000.

Figure 1. Average accrual net farm income by herd size in 2000

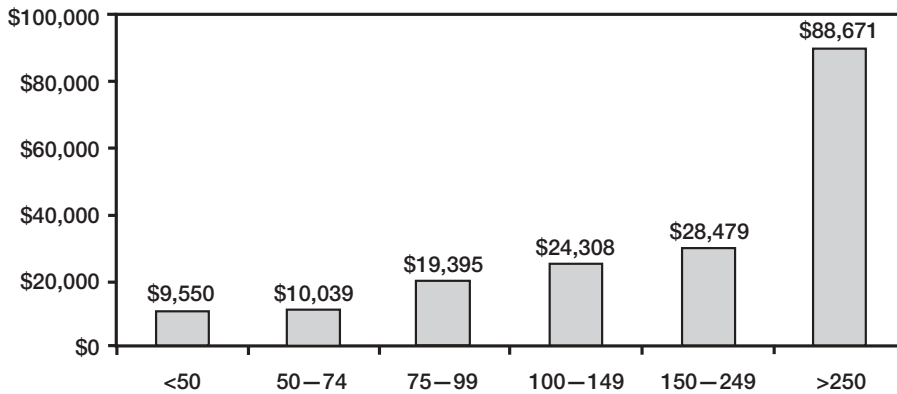


Figure 2. Average rate of return on farm assets by farm size in 2000

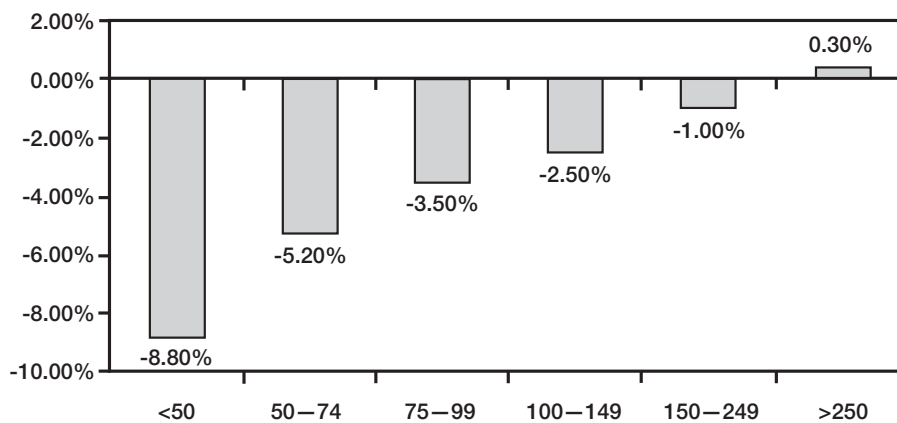
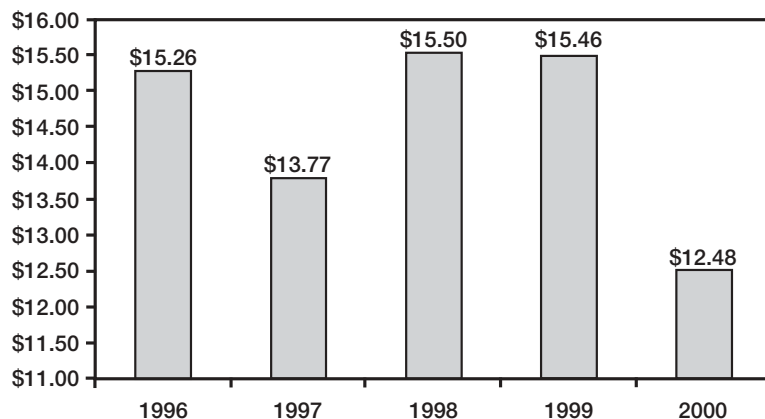


Figure 3. Prices received by Pennsylvania milk producers: 1996-2000



At this point, it would be instructive to analyze net farm income on both a per hundredweight and per cow basis and to discuss how farm profitability has changed over the past few years. First, however, we should review how milk prices received by Pennsylvania producers have changed from 1996 to 2000 (Figure 3). It is evident that milk prices were at their lowest point of the five-year period, almost \$1.30 below the next lowest year in 1997. This section will clearly show that farm profitability is strongly affected by the milk price.

Analyzing accrual net farm income on both a per cow and per hundredweight basis is useful for viewing income and expenses. These give an indication of how well production is being managed and expenses are being controlled. They also give us, on a limited basis, the ability to compare farms of different sizes.

In 2000, average accrual net income per hundredweight for all farms was at its lowest point since 1997 and fell by about \$1.50 from its 1999 level (Figure 4). When the smallest and largest farms are compared directly, it is evident that their level of net income in 2000 was approximately equal. However, smaller farms are typically less profitable, on a per hundredweight basis, than their larger counterparts. The one exception is 1999, when smaller farms had profits about \$0.50 higher than larger farms. It is also interesting to note that profits of larger farms tended to be more stable over the period in question. This may be a result of larger farms using some risk management tools not used by smaller farms. Thus, they may be less susceptible to the ups and downs of market prices.

When grouped by level of milk production, farms tend to follow a much more similar path than when grouped by farm size (Figure 5). That is, although the least-productive farms are generally below average in farm profitability, they are still subject to the same swings evidenced by all farms. Furthermore, the most productive farms also follow the average quite closely.

An analysis of net farm income per cow by level of milk production yields some obvious results (Figure 6). Specifically, those farms getting the most milk from their cows are also generating above-average levels of profit per cow every year. In 2000, farms producing more than 23,000 pounds per cow had farm profits about \$300 per cow greater than those farms producing less than 14,000 pounds per cow. In general, the difference in per cow profits has increased over the period, with a peak of about \$425 in 1999. The more-productive farms have also tended to move away from average per cow profit levels, although to a lesser extent.

If we analyze profit per cow by herd size, the result is not as clear (Figure 7). Specifically, there are several instances in which the lines cross over time. In 1996, 1997, and 2000, smaller farms were less profitable, on a per cow basis, than were larger farms. However, they were more profitable in 1998 and 1999. This result is similar to that comparing farm profit on a per hundredweight basis, shown in Figure 4. Notice that the patterns in Figures 4 through 7 tend to mimic the pattern of prices in Figure 3.

In general, Figures 4 through 7 provide some evidence that farm productivity is more important than farm size in affecting farm profits. It is clear that the more-productive farms have higher per cow and per hundredweight profit levels than do the less-productive farms. However, analyses based on herd size do not exhibit a consistent pattern. This begs the question, does more production absolutely mean higher profits? The answer is “No!”

In theory, a producer could reach a point at which it becomes less profitable to increase production (although there is little evidence that most producers are near this point). However, progressive producers should closely monitor their farm profits and make production decisions to enhance their bottom line. Producers must decide if, for example, altering a ration or finding ways to improve cow comfort will increase production and benefit the bottom line.

Figure 4. Accrual net farm income per hundredweight by farm size: 1996–2000

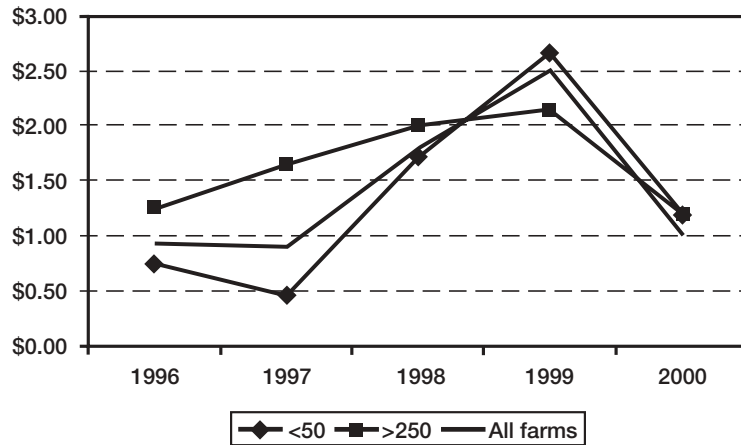


Figure 5. Accrual net farm income per cwt. by farm productivity: 1996–2000

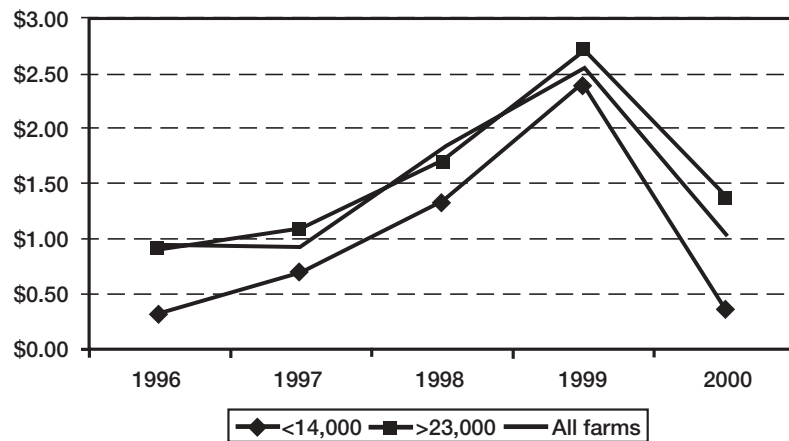
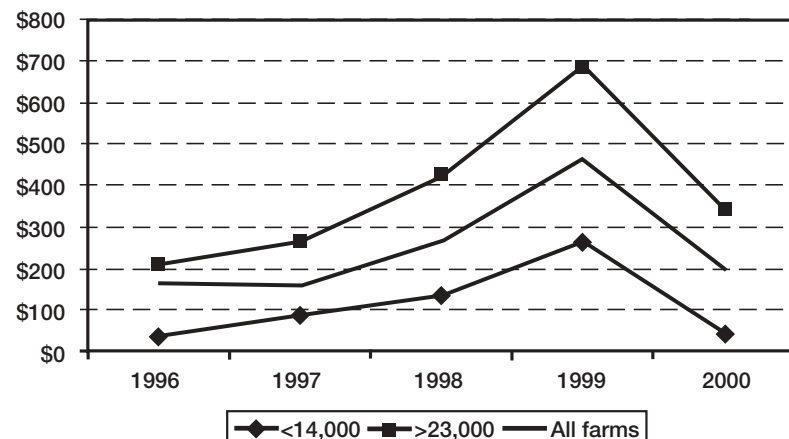


Figure 6. Accrual net farm income per cow by farm productivity: 1996–2000



Many producers have lots of room to improve production before reaching the point at which it becomes less profitable to increase production.

Regardless of industry, most businesses strive to generate a return on assets that is above the rate of inflation and, preferably, close to the prevailing interest rates. If successful, they will be able to generate returns comparable to other potential investments. This is important because if the farmer's rate of return on assets is too low, especially for several years, it indicates that there is a foregone opportunity to invest assets in a more profitable alternative. Return on assets is affected by the milk price received, production level, financial and capital efficiency, and owner draws.

In general, ROA follows the same pattern as prices from 1996 to 2000 (Figure 8). Typically, ROA levels are higher on larger farms. Because ROA is a relative measure, we can directly compare one farm to another. Since larger farms tend to have a higher ROA, they are managed in such a way to generate a greater return to the farm's assets. It may be that farm size is transitory over time. That is, farms generating a relatively high ROA are more likely to expand over time. If this is true, then it may not necessarily be the case that increasing farm size "causes" ROA to grow. Rather, it is likely that a higher ROA "causes" farms to expand. Furthermore, farms generating a relatively low ROA tend to stay small because they are not generating sufficient returns to grow the farm business.

ROA can be calculated by a second method, multiplying asset turnover by profit margin. Profit margin is determined by dividing net farm income by sales, and asset turnover is determined by dividing sales by assets. By using this method for calculating ROA, farmers can see how a change in either of these two parts will affect farm profitability. Since profit margin is relatively hard to change, farmers usually strive to increase their asset turnover. That is, producers should work to generate the maximum sales they can achieve given their current asset bases.

Efficiency

Efficiency is defined as a ratio of output (production) to total resources (inputs) used. Efficiency is increased as output per unit of inputs increases. Larger dairy farms are usually more efficient in this sense, although a wide variation in efficiency exists among the sample farms. The quality of management is a critical determinant of the degree of efficiency achieved. Well-managed small farms can be more efficient, and thus more profit-

able per unit of output, than poorly managed large farms.

The most commonly used measure of efficiency among dairy farmers is milk produced and sold per cow (Figure 9). Greater production per animal will result in increased revenue for the business. If expenses can be held at the same level while increasing production, and therefore sales, the farm will increase profitability.

Figure 7. Accrual net farm income per cow by farm size: 1996–2000

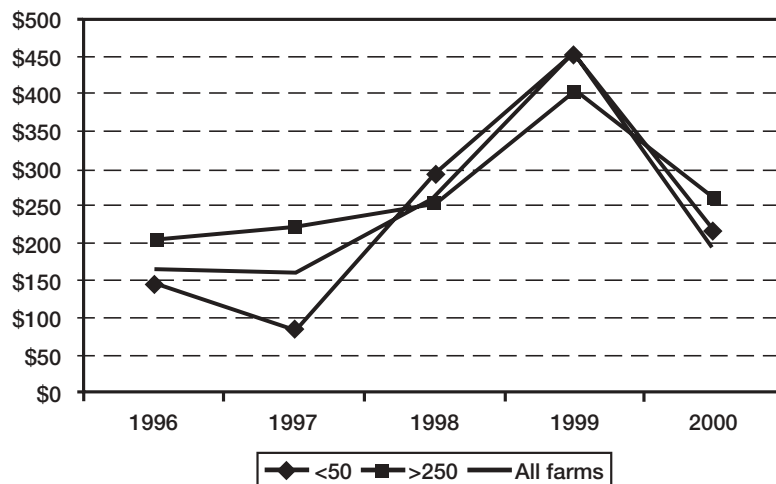
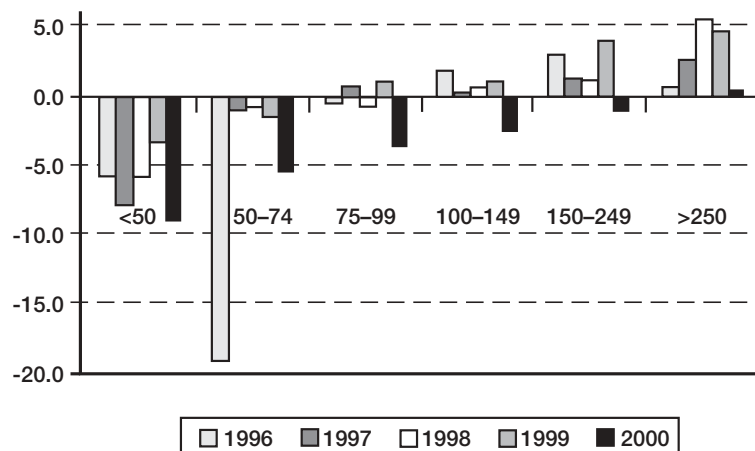


Figure 8. Return on farm assets by farm size: 1996–2000



Note: It is unclear from past publications why the ROA for farms with 50 to 74 cows is significantly different from the other farms in 1996.

Overall, there has been an increase in the pounds of milk produced and sold per cow during the past five years. Also, larger farms tend to produce more milk per cow than their smaller counterparts.

The cost associated with milk production is an extremely important factor in determining farm profits. Low-cost production is a good measure of efficiency. Costs are especially important to the farm manager because managerial decisions have only limited impact on the price received. Farm managers can improve milk quality, receiving associated premiums, or forward contract or hedge milk prices. But, generally speaking, managers cannot influence market prices. Profits, however, are variable from farm to farm and are directly related to actions taken by management to expand production and control costs.

Accrual expenses per hundredweight were used as the measure of cost of production rather than cash expense per hundredweight because the accrual expense adjustments allow for a more complete view of the “real” cost associated with milk production. Accrual expense adjustments include any change in the value of feed inventory, production supplies, and accounts payable. Depreciation of farm assets is also included.

Although only three years of data are available for accrual expenses, there is strong evidence of a negative relationship between milk sold per cow and the cost per hundredweight of producing milk each year (Figure 10). For example, in 2000, farms producing less than 14,000 pounds per cow had expenses of \$14.92 per hundredweight, while farms producing more than 23,000 pounds per cow had expenses of \$13.50 per hundredweight. This is a difference of \$1.42. Since farms with higher production per cow also tended to have more cows, these farms may have benefited from bulk purchase discounts on variable expense items. Additionally, the higher milk production from the cows spreads fixed costs over more units, thus lowering expense per hundredweight.

Figure 9. Milk production per cow by herd size: 1996–2000

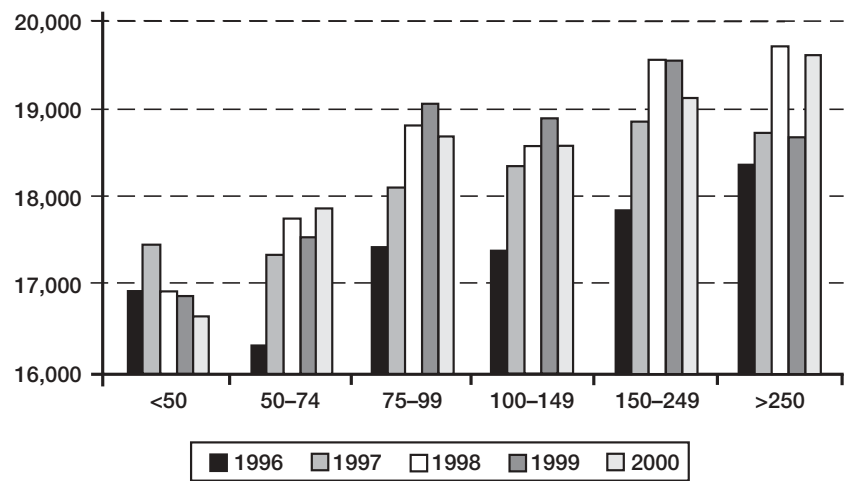
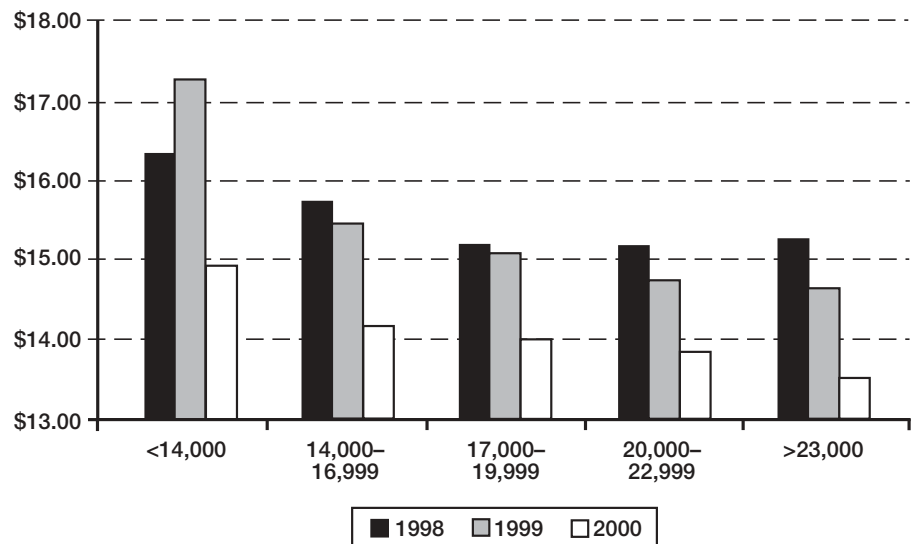


Figure 10. Accrual costs per hundredweight by farm productivity: 1998–2000



Looking at specific expense categories can indicate where farms are achieving efficiency or where improvements need to be made. Seven cash expense items (purchased feed, labor, machinery, milk marketing, crop and fertilizer, rent, and interest) were separated from the total to study the distribution of expenses on farms. In Figures 11 through 14, we analyze the percentage of total cash expenses (on both a per cow and per hundredweight basis) comprised of these specific categories. (Cash expenses are used to allow producers to make easier comparisons with these figures.)

Purchased feed comprises the largest single category, as a percentage of cash expenses.

This is true for all analyses. When analyzed on a per-hundredweight basis by herd size (Figure 11), the percentage ranges from about 23 to 30 percent. In general, there is no evident trend across farm sizes. Obviously, the farmer who chooses to focus on cows and purchase more feed, as opposed to growing it, will have a higher percentage on purchased feed.

Most of the other categories are fairly constant across herd sizes. However, the percentage of expenses going to hired labor increases noticeably from small to large herds. Farms with less than 50 cows spend about 4 percent of their expenses on hired labor. This increases to about 14

percent for farms with more than 250 cows. With these expenses increasing, it is apparent that larger farms substitute hired labor for other inputs at a rate greater than smaller farms do.

Categories of cash expense per hundredweight are very consistent across farm production levels (Figure 12). There is a slight increase in hired labor for the most productive farms. However, there are no significant differences across farm sizes.

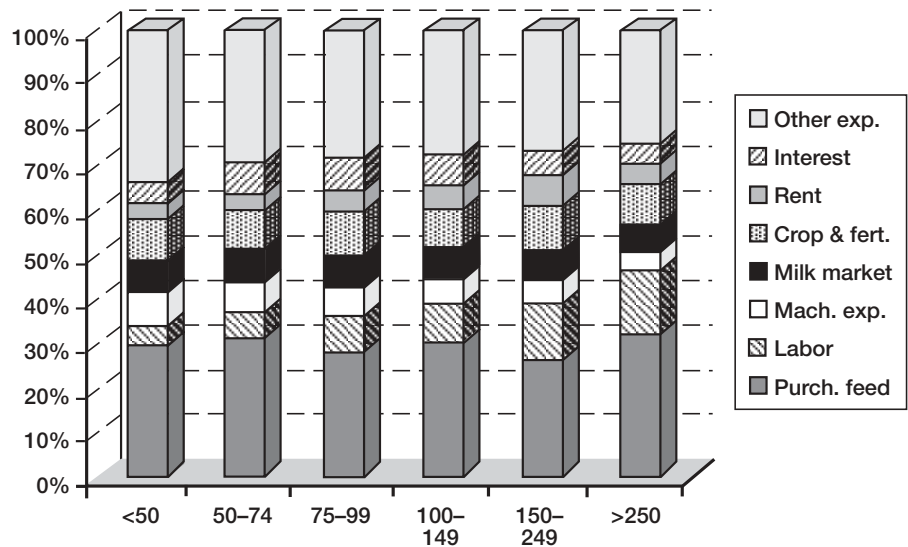
As a percentage of total expenses per cow, hired labor again increases with herd size (Figure 13). Furthermore, until farms reach 250 cows, expenses on feed tend to fall. However, all other categories are relatively stable.

Farm expenses per cow are distributed similarly, regardless of whether analyzed by farm size or production (Figure 14). Notice again that there appears to be a slight dip in purchased feed per cow for the largest farms. However, there are no significant differences across these categories.

Milk per worker equivalent is a fourth measure of efficiency that is useful, but not often discussed. This measure can help the manager determine whether labor is being utilized efficiently. Larger farms obviously need more labor than smaller farms. However, workers on larger farms are more able to specialize in a particular job, such as milking or feeding. Whereas, on smaller farms, fewer people are responsible for a wide array of tasks to keep the farm running smoothly.

Since 1996, milk sold per worker equivalent has generally increased across all production levels (Figure 15). This can be contributed to the increases in milk production per cow throughout the years.

Figure 11. Cash expense categories per hundredweight as a percentage of total expenses by herd size: 2000



That is, dairy farm efficiency has generally increased over time. Across all farms, milk production per worker equivalent has increased by about 80,000 pounds over the five-year span being considered.

Another ratio that can assist in determining capital efficiency is the capital turnover ratio. Capital turnover is calculated by dividing the total value of farm assets by gross revenue. The result is the number of years, like the current one, that it will take to generate the income necessary to equal the current value of farm assets. Milk production and price received for milk directly affect the gross revenue portion. However, the farm manager can control only milk production. Therefore, by producing more milk, the years required for a farm's capital turnover could be lowered.

For the farms in the 2000 sample, capital turnover decreased as milk per cow increased. The average number of years for capital turnover was 2.32, with a high

of 2.90 years for farms with less than 14,000 pounds per cow, to a low of 2.00 years for farms with production of more than 23,000 pounds per cow. An aspect of farm organization that can affect capital turnover is the farm's degree of specialization. Operations that specialize in milking cows will usually have a lower capital turnover than operations that milk cows and raise crops. The reason is that the capital investment in land and machinery required by these specialized farms is lower than farms doing everything.

Figure 12. Cash expense categories per hundredweight as a percentage of total expenses by farm productivity: 2000

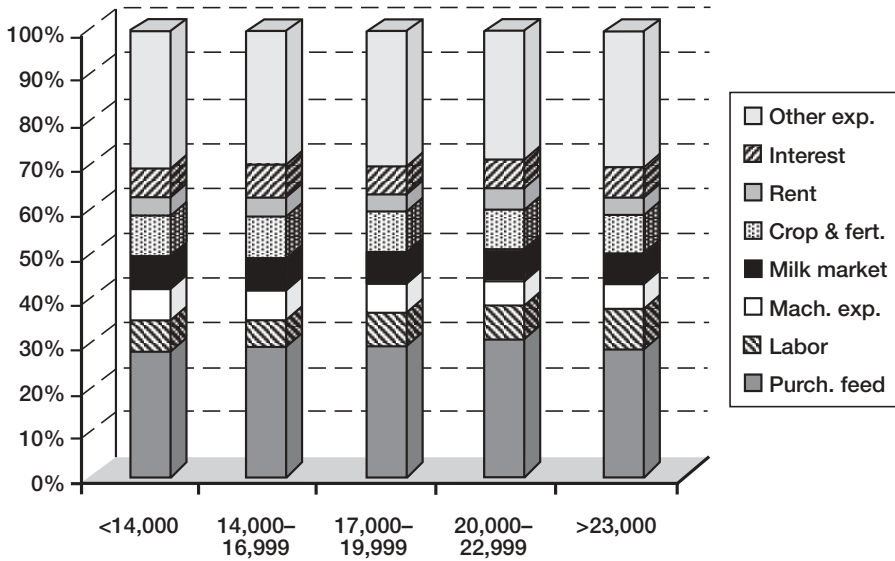


Figure 13. Cash expense categories per cow as a percentage of total expenses by herd size: 2000

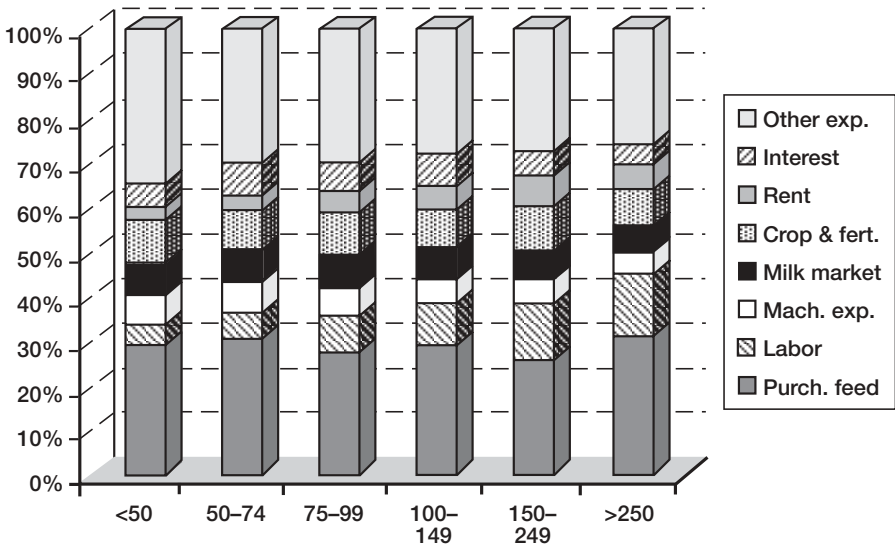


Figure 14. Cash expense categories per cow as a percentage of total expenses by farm productivity: 2000

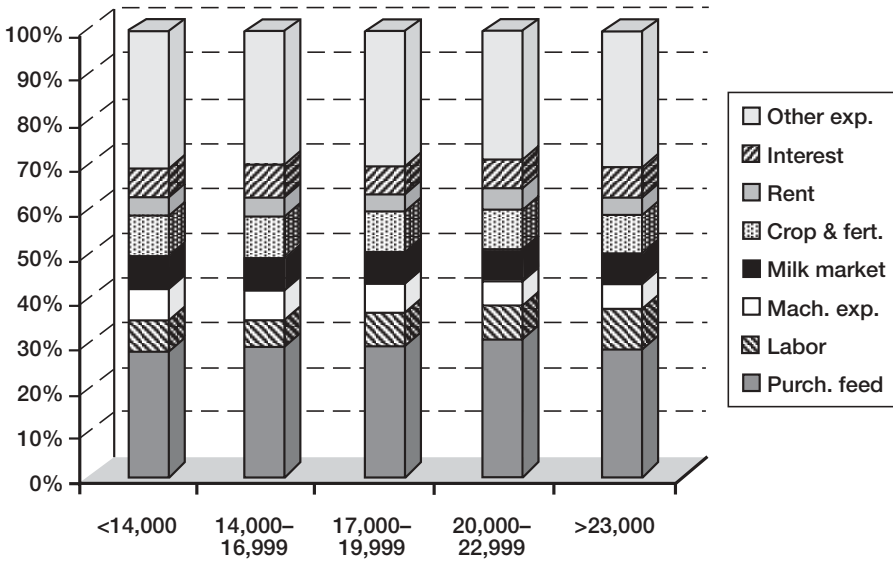
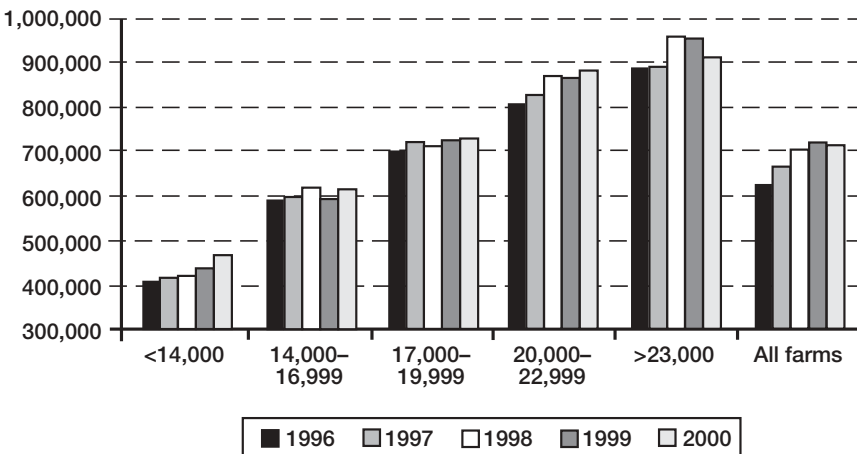


Figure 15. Milk produced per worker equivalent by farm productivity: 1996-2000



Part IV: Conclusion

The objective of this publication is to provide the most current data possible on the financial and production performance of Pennsylvania dairy farms and to analyze these data from a historical perspective. It is apparent that the success of the Pennsylvania dairy industry as a whole is heavily dependent upon milk prices. However, some individual farms that are well managed still operated profitable businesses in 2000 without jeopardizing their family's standard of living or, more importantly, their equity level.

Over time, farm efficiency continues to increase. Data not reported here show that the industry is producing more milk with fewer cows. However, shrinking margins mean that producers must strive for maximum efficiency to remain competitive and viable in the industry. Using this publication and other information available, farmers should assess their current situations and make strategic decisions to ensure the long-term viability of their dairy operations.

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