

ESO No. 1329

SUMMARY REPORT ON FINANCIAL, SIZE AND PERFORMANCE
DATA FOR 114 DAIRY FARMS
OHIO, 1985

by

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MARCH, 1987

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Summary Report On Financial, Size and Performance Data For 114 Dairy Farms, Ohio, 1985

INTRODUCTION

This summary is compiled from a sample of 114 Ohio dairy farms participating in the Agrifax farm records program in 1985. Agrifax is operated through the Federal Land Bank and Federal Intermediate Credit Bank of Louisville, District IV, which include the states of Indiana, Kentucky, Tennessee and Ohio. Data on Ohio farms were made available to The Ohio State University for research purposes, with the understanding that none of the data on the individual farms would be identified by name or location.

Farms in the sample were defined as dairy farms if at least 50% of the Value of Farm Production was from the sale of milk and dairy products. These farms are not necessarily representative of all Ohio dairy farms, but they do provide an indication of results for Ohio's dairy producers. Similar data is also available in 1985, for a sample of 128 Ohio cash grain farms and 32 Ohio swine farms, and are reported in separate publications.

These farms were summarized for various characteristics including financial performance, debt, farm size, and economic efficiency. In addition, the farms were sorted into subgroups by size of dairy herd, by debt to asset ratio, and net farm earnings. The 5 farm size groups, measured by number of dairy cows, were: 20-39, 40-59, 60-79, 80-119, and 120 Plus cows. The 3 categories measured by debt as a percentage of assets (D/A Ratio) were: Up to 40, 41-70, and 71 plus. Net farm earnings were divided into top 1/3, middle 1/3 and bottom 1/3. Various tables show the results of summarizing the data by these categories. The results by size of farm are presented first, followed by the D/A ratio tables and net farm earnings tables.

HIGHLIGHTS -- DAIRY FARMS BY NUMBER OF COWS

Overview of Farms Summarized

The 114 Dairy Farms averaged 89 cows, 396 tillable acres, and had annual sales as measured by Value of Farm Production of \$226,627 (Table 1). On average, the Balance Sheet showed \$798,500 in assets, \$369,600 in liabilities, and \$428,900 of equity. Their average debt to asset ratio was .46 and financially stable. Crop yields averaged 123 bushels per acre for corn, 42 for soybeans, and 56 for wheat. Corn silage averaged 17 tons per acre and hay 2.9 tons per acre. Of the total 396 tillable acres, 184 acres were owned, 194 acres were cash rented, and 17 acres were share rented. This represents 47% owned, 49% cash rented, and 4% share rented of total tillable acres farmed.

Table 1: Number of Farms, Crop Yields, and Measures of Size for 114 Dairy Farms
By Number of Cows, Ohio, 985

Size Characteristics	Unit	FARM SIZE IN NUMBER OF COWS					All Farms
		20-39	40-59	60-79	80-119	120 Plus	
NUMBER OF FARMS	Number	14	23	27	23	27	114
NUMBER OF DAIRY COWS	Head	33	49	69	96	165	89
TILLABLE ACRES FARMED	Acres	156	233	382	444	632	396
VALUE OF FARM PRODUCTION	\$	\$72,346	\$117,002	\$190,866	\$258,519	\$408,604	\$226,627
BALANCE SHEET DATA							
Total Assets	\$1,000	361.6	552.5	703.9	877.6	1261.6	798.5
Total Liabilities	\$1,000	172.1	251.5	316.8	412.4	588.8	369.6
Total Equity	\$1,000	189.5	301.0	387.1	465.2	672.8	428.9
CROP YIELDS							
Corn	Bu./A.	124	119	103	124	131	123
Soybeans	Bu./A.	41	36	39	41	46	42
Wheat	Bu./A.	45	48	58	53	57	56
Corn Silage	Ton/A.	22	15	10	18	17	17
Hay	Ton/A.	3.4	2.6	2.9	3.1	2.8	2.9
CROP ACRES							
Corn	Acre	61	88	130	227	367	183
Soybeans	Acre	74	119	118	115	279	135
Wheat	Acre	9	17	35	35	42	33
Corn Silage	Acre	17	26	52	44	73	40
Hay	Acre	34	83	79	126	159	108
TILLABLE ACRES BY TENURE							
Total Owned	Acres	136	171	208	262	371	241
Tillable Owned	Acres	105	131	164	197	281	184
Tillable Cash Rented	Acres	40	99	182	218	346	194
Tillable Share Rent	Acres	11	3	37	28	5	17
TOTAL TILLABLE	Acres	156	233	382	444	632	396
PERCENT OF TILLABLE ACRES							
Owned	Percent	67	56	43	45	44	47
Cash Rented	Percent	26	43	47	49	55	49
Share Rented	Percent	7	1	10	6	1	4

The farms are fairly well distributed over the five size classes by number of cows per farm with the 60-79 class and the 120 Plus class having 27 farms each. In terms of a useful sample to depict income and performance measures for various sized farms, this appears to be a good sample.

When comparisons are made of farm size measures between the five size groups, there is a normal increase in acres, Value of Farm Production, and balance sheet data. There are differences in how they acquired the land they farm, with 40-59 dairy farms owning 67% of the land, while the larger dairy farms with over 60 cows own only 43-45%. However, the larger dairy farms cash rented a larger percentage of their land ranging from 47% to 55% while the 20-39 dairy farms only cash rented 26%. The 60-79 class farms share rented the most acreage at 10% followed by the 20-39 class farms with 7% and 80-119 farms with 6% of farm acres share rented.

Measures of Earnings

In 1985 these 114 Dairy farms had an average Value of Farm Production of \$226,627 (Table 2). Cash receipts of \$228,426 combined with negative inventory changes and other adjustments of (\$1,799) resulted in a final figure of \$226,627. Total expense, including both variable and fixed expenses, totaled \$213,935. See Table 3 for a detailed income statement.

Table 2: Income, Expense and Measures of Earnings For 114 Dairy Farms
By Number of Cows, Ohio, 1985.

Financial Characteristics	Unit	FARM SIZE IN NUMBER OF COWS					
		20-39	40-59	60-79	80-119	120 Plus	All Farms
INCOME							
Total Cash Income	\$	\$85,954	\$122,484	\$189,372	\$270,777	\$395,526	\$228,426
Other Income & Inv. Changes	\$	(\$13,608)	(\$5,482)	\$1,494	(\$12,258)	\$13,078	(\$1,799)
VALUE OF FARM PRODUCTION	\$	\$72,346	\$117,002	\$190,866	\$258,519	\$408,604	\$226,627
EXPENSE							
Total Variable Expense	\$	\$50,960	\$65,908	\$109,043	\$152,298	\$229,448	\$130,451
Total Fixed Expense	\$	\$28,089	\$47,332	\$62,277	\$104,853	\$146,008	\$83,484
TOTAL FARM EXPENSE	\$	\$79,049	\$113,239	\$171,320	\$257,151	\$375,457	\$213,935
EARNINGS							
Net Farm Earnings	\$	(\$6,703)	\$3,763	\$19,546	1,367	\$33,147	\$12,692
Net NonFarm Income	\$	\$9,990	\$9,064	\$4,554	\$6,564	\$3,344	\$6,251
NET EARNINGS	\$	\$3,287	\$12,826	\$24,101	\$7,932	\$36,492	\$18,943
Operator Labor Draw	\$	\$17,350	\$16,888	\$19,466	\$19,371	\$32,406	\$21,732
Income Tax	\$	\$551	\$685	\$441	\$141	\$587	\$478
TOTAL NET EARNINGS	\$	(\$14,614)	(\$4,746)	4,194	(\$11,581)	\$3,498	(\$3,267)
NET FARM EARNINGS	\$	(\$6,703)	\$3,763	\$19,546	\$1,367	\$33,147	\$12,692
RETURN TO UNPAID LABOR & MGT	\$	(\$18,071)	(\$14,297)	(\$3,680)	(\$26,543)	(\$7,224)	(\$13,041)
RETURN TO INVESTMENT	\$	(\$11,639)	\$8,347	\$24,639	\$24,487	\$56,492	\$24,411
RETURN TO EQUITY	\$	(\$24,053)	(\$13,125)	\$80	(\$18,003)	\$741	(\$9,040)

Table 3: Income Statement For 114 Dairy Farms By Number of Cows, Ohio, 1985

INCOME STATEMENT	Unit	FARM SIZE IN NUMBER OF COWS					All Farms
		20-39	40-59	60-79	80-119	120 Plus	
CASH INCOME							
Crops	\$	\$8,127	\$9,304	\$20,208	\$26,587	\$23,277	\$18,538
Hogs	\$	\$687	\$2,053	\$7,759	\$262	\$23	\$2,395
Dairy Products	\$	\$59,101	\$90,892	\$137,002	\$191,945	\$327,685	\$174,379
Dairy	\$	\$11,794	\$13,937	\$14,035	\$32,159	\$29,650	\$21,095
Beef	\$	\$251	\$1,126	\$1,331	\$5,105	\$1,514	\$1,962
Sheep	\$	\$0	\$86	\$22	\$0	\$0	\$23
CCC	\$	\$0	\$0	\$749	\$0	\$0	\$177
Other Farm Income	\$	\$5,994	\$5,086	\$8,266	\$14,719	\$13,375	\$9,857
TOTAL CASH INCOME	\$	\$85,954	\$122,484	\$189,372	\$270,777	\$395,526	\$228,426
Resale Purchases	\$	(\$32)	(\$1,085)	(\$1,098)	(\$601)	(\$27)	(\$610)
Breeder L.S. purchase	\$	(\$4,456)	(\$4,616)	(\$3,073)	(\$4,798)	(\$2,936)	(\$3,870)
L.S. Inventory Change	\$	(\$9,836)	(\$2,328)	\$2,047	(\$12,111)	\$2,115	(\$3,135)
Crop & Feed Inv. Change	\$	(\$1,040)	\$3,409	\$3,842	\$4,648	\$12,972	\$5,736
Acct Rec Change	\$	(\$442)	(\$947)	(\$479)	\$342	\$614	(\$144)
Net Non-Cash Farm Income	\$	\$118	\$85	\$234	\$262	\$340	\$220
L.S Pay/Futures Changes	\$	\$0	\$0	\$21	\$0	\$0	\$5
VALUE OF FARM PRODUCTION	\$	\$72,346	\$117,002	\$190,866	\$258,519	\$408,604	\$226,627
EXPENSES							
Variable Expenses							
Wages	\$	\$4,988	\$5,472	\$12,038	\$24,141	\$33,264	\$17,316
Repair Machinery	\$	\$4,214	\$4,040	\$10,004	\$11,537	\$18,394	\$10,386
Feed	\$	\$13,119	\$16,852	\$26,140	\$33,601	\$53,126	\$30,564
Seed & Plants	\$	\$1,882	\$3,538	\$4,881	\$5,446	\$9,047	\$5,342
Fertilizer & Lime	\$	\$5,514	\$7,668	\$13,750	\$16,005	\$24,522	\$14,518
Spray & Chemicals	\$	\$1,660	\$2,533	\$5,157	\$7,438	\$8,956	\$5,558
Custom Hire	\$	\$1,401	\$1,895	\$1,608	\$2,139	\$5,582	\$2,689
Supplies	\$	\$3,860	\$3,868	\$4,889	\$7,706	\$9,946	\$6,323
Breeding	\$	\$1,203	\$1,382	\$1,796	\$2,546	\$4,320	\$2,389
Vet & Medicine	\$	\$1,482	\$2,225	\$3,371	\$5,634	\$8,432	\$4,563
Fuel & Lube	\$	\$2,210	\$4,631	\$8,947	\$9,567	\$13,108	\$8,360
Utilities	\$	\$2,002	\$3,475	\$4,410	\$5,641	\$8,820	\$5,219
Marketing	\$	\$3,008	\$2,898	\$3,960	\$6,003	\$11,304	\$5,790
Storage	\$	\$426	\$87	\$221	\$680	\$873	\$466
Other Than Above	\$	\$3,910	\$5,343	\$7,871	\$14,213	\$19,753	\$10,968
TOTAL VARIABLE EXPENSE	\$	\$50,960	\$65,908	\$109,043	\$152,298	\$229,448	\$130,451
Fixed Expenses							
Interest	\$	\$12,414	\$21,473	\$24,558	\$42,492	\$55,752	\$33,450
Taxes	\$	\$1,374	\$1,860	\$2,723	\$4,317	\$5,828	\$3,440
Lease Payments	\$	\$2,160	\$6,185	\$9,782	\$14,849	\$21,864	\$12,004
Insurance	\$	\$1,271	\$2,267	\$2,916	\$4,379	\$6,802	\$3,799
Building Repairs	\$	\$666	\$1,128	\$1,277	\$2,030	\$3,433	\$1,835
Building Depreciation	\$	\$2,704	\$4,686	\$7,003	\$13,633	\$19,923	\$10,405
Equipment Depreciation	\$	\$7,501	\$9,732	\$14,018	\$23,153	\$32,406	\$18,551
TOTAL FIXED EXPENSE	\$	\$28,089	\$47,332	\$62,277	\$104,853	\$146,008	\$83,484
TOTAL FARM EXPENSE	\$	\$79,049	\$113,239	\$171,320	\$257,151	\$375,457	\$213,935
NET FARM EARNINGS	\$	(\$6,703)	\$3,763	\$19,546	\$1,367	\$33,147	\$12,692

Net Farm Earnings were \$12,692 on average for these farms in 1985 with an average Net Non-farm Income of \$6,251 for Total Net Earnings of \$18,943. Deduction for family living (Operator Labor Draw) and income tax reduced Total Net Earnings to a negative number at (\$3,267).

When these figures are examined by size group, only the 60-79 class and 120 Plus class farms had positive Total Net Earnings at \$4,194 and \$3,498, respectively. However, all classes of farms have positive Net Farm Earnings except the 20-39 cow group with a negative (\$6,703). The 60-79 cow farms and the 120 Plus cow farms had the highest Net Farm Earnings at \$19,546 and \$33,147. The 20-39 cow farms have slightly more non-farm earnings at \$9,990 and considerably less family living expense (Operator Labor and Draw) at \$17,350 but they still had one of the lowest Total Net Earnings due to negative Net farm Earnings. The smaller dairy farms tended to have higher NonFarm Income compared to the larger farms. The 120 Plus cow farms had the highest family living expense at \$32,406 with the other farms in the range of \$16,888 to \$19,466.

Returns to Unpaid Labor & Management were negative and averaged (\$13,041) for the 114 dairy farms in 1985. This measure is calculated by deducting a 6 percent charge for equity capital from Net Farm Earnings. Return to Investment averaged \$24,411 while Return to Equity is a negative (\$9,040). By size groups, Return to Investment increase as the farms get larger, from a negative (\$11,639) for the 20-39 cow farms to a positive \$56,492 for the 120 Plus cow farms. Return to Unpaid Labor and Management was negative for all size classes but the 60-79 and 120 Plus cow farms had the highest returns at (\$3,680) and (\$7,224). The 120 Plus group shows the highest Return to Equity Capital at \$741 followed by the 60-79 cow farms at \$80, which are the only two positive returns.

Balance Sheet Data

Average Balance Sheet results for 1985 shows \$798,500 in Total Assets, \$369,600 in Total Liabilities, and \$428,900 in Total Equity (Table 4). Approximately 12% of the assets are current, a little over a third intermediate and roughly 55% are fixed assets for all the farms. During 1985, the change in owner equity was a negative (\$2,600) for the average. The 20-39, 60-79, and 80-119 cow farms had a losses of (\$7,200), (\$6,400), and (\$15,800) while the 40-59 and 120 Plus cow farms had positive changes in owners equity equal to \$600 and \$11,900.

Other balance sheet ratios help to portray the financial situation of these dairy farmers. Measures of liquidity give an indication of how well they may be able to make annual payments. Lenders prefer the Current Ratio, comparing current assets to

current liabilities, to be 2.0 or better. The average for all farms in 1984 was only 1.76, slightly below the desired level. The ratio of current to total liabilities of .15 shows that just over 15% of their liabilities is due annually. The Intermediate Ratio, comparing current & intermediate assets to current & intermediate liabilities, of 2.80 is above the desired ratio of at least 2.0. In general, these farms are in good financial condition.

Turning to solvency ratios, the average Debt to Asset Ratio (and its mirror image, the Equity Ratio) for all farms were 46% and 54%, respectively, indicating they have slightly more equity than debt, with an average leverage ratio, or liabilities to equity, of .86. Net Farm Earnings as a Percent of Average Farm Assets was a positive 1.71. Net Farm Earnings as a percent of Average Farm Assets ranged from a low of - 2.18% for the 20-39 cow farms to a high of 3.01% for the 60-79 cow farms.

Table 4: Balance Sheet Data On 114 Dairy Farms By Number of Cows, Ohio, 1985.

BALANCE SHEET INFORMATION	Unit	FARM SIZE IN NUMBER OF COWS					All Farms
		20-39	40-59	60-79	80-119	120 Plus	
BALANCE SHEET DATA							
Current Assets	\$1,000	35.7	61.9	91.4	114.0	150.4	97.2
Current Liabilities	\$1,000	18.5	35.7	46.5	53.3	101.3	55.3
Current Equity	\$1,000	17.2	26.2	44.9	60.7	49.1	41.9
Intermediate Assets	\$1,000	100.3	154.4	236.1	309.2	463.7	271.6
Inter. Liabilities	\$1,000	25.5	46.8	69.7	71.9	135.3	75.6
Inter. Equity	\$1,000	74.8	107.6	166.4	237.3	328.4	196.0
Fixed Assets	\$1,000	225.6	336.2	376.4	454.4	647.5	430.0
Fixed Liabilities	\$1,000	128.1	169.0	200.6	287.2	352.2	238.7
Fixed Equity	\$1,000	97.5	167.2	175.7	167.2	295.3	191.0
Total Assets	\$1,000	361.6	552.5	703.9	877.6	1261.6	798.5
Total Liabilities	\$1,000	172.1	251.5	316.8	412.4	588.8	369.6
Total Equity	\$1,000	189.5	301.0	387.1	465.2	672.9	428.9
Owners Equity Change, 84-85	\$1,000	-7.2	.6	-6.4	-15.8	11.9	-2.6
FINANCIAL PERFORMANCE MEASURES							
Liquidity Ratios							
Current Ratio (CA/CL)	Ratio	1.92	1.73	1.97	2.14	1.48	1.76
CurrLiab/TotLiab (CL/TL)	Ratio	.11	.14	.15	.13	.17	.15
Inter. (CA+IA)/(CL+IL)	Ratio	3.09	2.62	2.82	3.38	2.60	2.82
Solvency Ratios							
Debt/Asset(D/A)or(TL/TA)	Ratio	.48	.46	.45	.47	.47	.46
Equity Ratio (TE/TL)	Ratio	.52	.54	.55	.53	.53	.54
Leverage Ratio (TL/TE)	Ratio	.91	.84	.82	.89	.88	.86
Profitability							
Net Farm Earnings as % of							
Average Farm Assets	%	-2.18	.74	3.01	.17	2.76	1.71

Table 5: Measures of Financial Efficiency On 114 Dairy Farms By Number of Cows, Ohio, 1985.

Efficiency Measures	Unit	FARM SIZE IN NUMBER OF COWS					
		20-39	40-59	60-79	80-119	120 Plus	All Farms
FINANCIAL EFFICIENCY							
Turnover Ratio	Ratio	.24	.23	.29	.32	.34	.31
Debt Service Ratio	Ratio	41.19	19.69	9.89	20.57	13.38	16.09
PROFITABILITY							
Net Profit Margin	Percent	-16.09	7.13	12.91	9.47	13.83	10.77
Return On Investment	Percent	-3.79	1.64	3.79	3.05	4.70	3.29
Return On Equity	Percent	-12.69	-4.36	.02	-3.87	.11	-2.11
Rate of Growth in Equity	Percent	-7.71	-1.58	1.08	-2.49	.52	-.76
EXPENSE AND EARNINGS AS A PERCENT OF VALUE OF FARM PRODUCTION							
Interest	Percent	17.16	18.35	12.87	16.44	13.64	14.76
Depreciation	Percent	14.11	12.32	11.01	14.23	12.81	12.78
Other Operating Expense	Percent	78.00	66.11	65.88	68.80	65.44	66.86
Net Farm Earnings	Percent	-9.27	3.22	10.24	.53	8.11	5.60
Total	Percent	100.00	100.00	100.00	100.00	100.00	100.00
TOTAL EXPENSE AS A PERCENTAGE OF VALUE OF FARM PRODUCTION							
Variable Expense	Percent	70.44	56.33	57.13	58.91	56.15	57.56
Fixed Expense	Percent	38.83	40.45	32.63	40.56	35.73	36.84
Total	Percent	109.27	96.78	89.76	99.47	91.89	94.40

Measures of Financial Efficiency

Dairy Farms require a large amount of capital relative to sales. In 1985, these farms averaged 31 cents in sales for each dollar of investment (Table 5). The Turnover Ratio ranged from .23 for the smallest to .34 for the largest dairy farms. Dairy farms have a higher Net Profit Margin, on average, at 10.77 than do swine farms at 7.47 or cash grain farms at 6.00.

It is also interesting to look at a breakdown of the factors that must be covered by the Value of Farm Production. In an accounting definition, Value of Farm Production must equal Variable Expense Plus Fixed Expense Plus Net Farm Earnings. Examining the importance of these parts, Table 5 shows that Interest Expense accounts for 15%, Depreciation 13%, Other Operating Expense 67% and the residual, Net Farm Earnings, 5.6%. Interest Expense was the lowest for 60-79 and 120 Plus farms, and highest for the 20-39 and 40-59 farms. Variable Expense as a Percentage of the Value of Farm Production averaged 58%, Fixed Expense 37%, with Total expense of 94.4%. The smallest farms had much more Variable Expense at 70%, while the 60-79 and 120 Plus dairy farms had much less fixed expense at 32.6% and 35.7%.

Table 6: Efficiency Measures and Cost per Tillable Acre on 114 Dairy Farms By Number of Cows, Ohio, 1985.

Efficiency Measures	Unit	FARM SIZE IN NUMBER OF COWS					
		20-39	40-59	60-79	80-119	120 Plus	All Farms
PRODUCTION EFFICIENCY PER TILLABLE ACRE							
Value of Crop Prod./T.A.	\$/A	\$52.10	\$39.90	\$52.84	\$59.91	\$36.85	\$46.83
Value of Total Prod./T.A.	\$/A	\$550.99	\$525.29	\$495.21	\$610.22	\$626.20	\$576.99
Variable Expense Per T.A.	\$/A	\$326.66	\$282.65	\$285.15	\$343.22	\$363.26	\$329.51
Fixed Expense Per T.A.	\$/A	\$180.06	\$202.99	\$162.86	\$236.30	\$231.16	\$210.87
Total Expense Per T.A.	\$/A	\$506.72	\$485.64	\$448.00	\$579.51	\$594.43	\$540.38
Machinery Investment/T.A.	\$/A	\$283.17	\$308.03	\$270.41	\$288.03	\$313.05	\$295.59
Machinery Cost Per T.A.							
Repair Machinery	\$/A	\$27.01	\$17.33	\$26.16	\$26.00	\$29.12	\$26.23
Custom Hire	\$/A	\$8.98	\$8.13	\$4.20	\$4.82	\$8.84	\$6.79
Fuel & Lube Cost	\$/A	\$14.17	\$19.86	\$23.40	\$21.56	\$20.75	\$21.12
Equipment Depreciation	\$/A	\$48.08	\$41.74	\$36.66	\$52.18	\$51.30	\$46.86
Machinery Investment@7.5%	\$/A	\$21.24	\$23.10	\$20.28	\$21.60	\$23.48	\$22.17
Machinery Cost Per T.A.	\$/A	\$119.48	\$110.15	\$110.70	\$126.16	\$133.50	\$123.17
Seed \$ Plant Cost Per T.A.	\$/A	\$12.06	\$15.17	\$12.76	\$12.27	\$14.32	\$13.49
Fert. & Lime Cost Per T.A.	\$/A	\$35.35	\$32.89	\$35.96	\$36.07	\$38.82	\$36.67
Spray & Chem Cost Per T.A.	\$/A	\$10.64	\$10.86	\$13.49	\$16.76	\$14.18	\$14.04
CAPITAL INVESTMENT							
Feed & Crop Capital	\$	\$21,301	\$29,982	\$55,281	\$67,005	\$109,347	\$61,174
Livestock Capital	\$	\$45,421	\$80,059	\$124,271	\$154,196	\$243,135	\$139,857
Machinery Capital	\$	\$44,174	\$71,824	\$103,407	\$127,811	\$197,729	\$117,024
Land & Building Cap	\$	\$179,739	\$306,059	\$335,171	\$408,481	\$603,851	\$388,635
Other Capital	\$	\$16,426	\$22,614	\$32,156	\$45,878	\$48,242	\$34,877
TOTAL FARM ASSETS	\$	\$307,061	\$510,538	\$650,286	\$803,371	\$1,202,305	\$741,568

Efficiency and Cost Measures Per Tillable Acre

The average farm had a Value of Crop Production per tillable acre of \$46.89 with a Total Value of Production per tillable acre of \$576.99 (Table 6). Value of Crop Production is only the value of cash crops sold, and does not include the value of livestock production or of hay and grain fed. The 120 Plus cow farms had a much greater Total Value of production per acre at \$626.20. Variable Expense per tillable acre averaged \$329.51, with Fixed Expense at \$210.87 and Total Expense at \$540.38. The 120 Plus cow group had the highest Variable, Fixed, and thus Total Expense per tillable acre at \$666.23. The 40-59 cow farms had the lowest Variable and Total Expense at \$594.43 per tillable acre.

Machinery Investment Per Tillable Acre averaged \$295.59 and Machine Cost Per Tillable Acre \$123.17. These costs include both field and livestock machinery and equipment. Seed & Plant Cost was \$13.49, Fertilizer and Lime Cost \$36.67, and Spray and Chemical Cost \$14.04 per tillable acre.

Efficiency and Cost Measures Per Cow

The average number of dairy cows was 89 on the 114 farms (Table 7). Milk Production Per Cow averaged 15,233 pounds and Total Milk Production 1,348,850 pounds. Milk Sales Per Cow averaged \$1,969 and Total Returns Per Cow \$2,098. The 60-79 cow group had the highest Milk Production Per Cow at 15,995 pounds, Milk Sales Per Cow at \$1,998 and the second highest Total Returns Per Cow at \$2,137.

Purchased Feed expense averaged \$259 and Total Feed Expense \$1,017 per cow. Returns Per \$100 of Feed Fed averaged \$206. By herd size, the 120 Plus cow farms had the highest Total Feed Expense per cow at \$1,028 and the second highest Return Per \$100 Feed Fed at \$211. The 80-119 cow farms had the highest Total Feed Expense at \$1,108 and the lowest Return Per \$100 of Feed Fed at \$186, while the 69-79 cow farms had the highest returns at \$221. The 20-39 cow farms had the lowest Total Feed Expense at \$819 per cow and average Return Per \$100 feed fed at \$210. Total Debt Per Cow averaged \$4,173 with the 120 Plus cow farms having only \$3,577 debt per cow increasing up to \$5,227 debt per cow for the 20-39 cow farms.

Table 7: Efficiency Measures and Cost Per Cow on 114 Dairy Farms By
Number of Cows, Ohio, 1985

Efficiency Measures	Unit	FARM SIZE IN NUMBER OF COWS					All Farms
		20-39	40-59	60-79	80-119	120 Plus	
NUMBER OF FARMS	Number	14	23	27	23	27	114
NUMBER OF DAIRY COWS	HEAD	33	49	69	96	165	89
TOTAL MILK PRODUCTION	CWT.	4,514.0	6,977.1	10,965.6	14,661.9	25,212.3	13,488.5
MILK PRODUCTION PER COW	LBS.	13708	14341	15995	15197	15318	15233
MILK SALES PER COW	\$/COW	\$1,795	\$1,868	\$1,998	\$1,990	\$1,991	\$1,969
TOTAL RETURNS PER COW	\$/COW	\$1,715	\$1,998	\$2,137	\$2,066	\$2,163	\$2,098
TOTAL DEBT PER COW	\$/COW	\$5,227	\$5,169	\$4,621	\$4,275	\$3,577	\$4,173
SALES OF DAIRY PRODUCTS	\$	\$59,101	\$90,892	\$137,002	\$191,945	\$327,685	\$174,379
SALES OF DAIRY ANIMALS	\$	\$11,794	\$13,937	\$13,945	\$32,159	\$29,650	\$21,074
OTHER DAIRY INCOME	\$	(\$14,402)	(\$7,601)	(\$4,411)	(\$24,829)	(\$1,251)	(\$9,654)
TOTAL DAIRY RETURNS	\$	\$56,493	\$97,222	\$146,536	\$199,275	\$356,084	\$185,799
VALUE OF FEED FED PER COW							
HAY	\$/COW	\$179	\$201	\$206	\$239	\$136	\$181
CORN SILAGE	\$/COW	\$81	\$137	\$109	\$125	\$137	\$127
GRASS SILAGE	\$/COW	\$0	\$0	\$2	\$6	\$7	\$5
HAYLAGE	\$/COW	\$97	\$135	\$129	\$146	\$222	\$173
CONCENTRATES	\$/COW	\$183	\$226	\$282	\$298	\$280	\$274
PURCHASED FEED	\$/COW	\$280	\$260	\$240	\$295	\$246	\$259
TOTAL VALUE OF FEED FED	\$/COW	\$819	\$959	\$968	\$1,108	\$1,028	\$1,017
RETURNS ABOVE FEED FED/COW	\$/COW	\$897	\$1,039	\$1,169	\$957	\$1,135	\$1,081
RETURNS PER \$100 FEED FED	\$/100	\$210	\$208	\$221	\$186	\$211	\$206

HIGHLIGHTS--DAIRY FARMS BY DEBT TO ASSET RATIO CLASSES

Tables 8 through 14 give similar information for the 114 dairy farms sorted by debt to asset ratios. The distribution is skewed towards the farms with less debt as the Up to 40 debt to asset class has 46 farms, with 41 in the 41-70 class and only 27 dairy farms in the 71 Plus group. The 41-70 debt to asset class has the largest number of cows at 99 and the highest Value of Farm Production at \$254,193. The Up to 40 class has the smallest number of dairy cows at 80, but had the most tillable acres at 424.

Table 8: Number of Farms, Crop Yields, and Measures of Size for 114 Dairy Farms
By Debt to Asset Ratios, Ohio, 1985.

DAIRY FARMS		DEBT AS A PERCENTAGE OF ASSETS			
Size Characteristics	Unit	Up To 40	41-70	71 Plus	All Farms
NUMBER OF FARMS	Number	46	41	27	114
NUMBER OF DAIRY COWS	HEAD	80	99	88	89
TOTAL TILLABLE	Acres	424	407	331	396
VALUE OF FARM PRODUCTION	\$	\$222,130	\$254,193	\$192,430	\$226,627
BALANCE SHEET DATA					
Total Assets	\$1,000	814.9	894.7	624.3	798.5
Total Liabilities	\$1,000	193.3	456.5	537.8	369.6
Total Equity	\$1,000	621.5	438.2	86.5	428.9
CROP YIELDS					
Corn	Bu./A.	127	116	121	123
Soybeans	Bu./A.	42	41	45	42
Wheat	Bu./A.	55	51	72	56
Corn Silage	Ton/A.	15	13	18	17
Hay	Ton/A.	3.0	2.9	2.9	2.9
CROP ACRES					
Corn	Acre	201	213	63	183
Soybeans	Acre	161	116	75	135
Wheat	Acre	30	36	35	33
Corn Silage	Acre	27	55	47	40
Hay	Acre	100	101	129	135
ACREAGE					
Total Owned	Acres	255	242	216	241
Tillable Owned	Acres	193	193	158	184
Tillable Cash Rented	Acres	216	197	152	194
Tillable Share Rent	Acres	15	18	21	17
TOTAL TILLABLE	Acres	424	407	331	396
PERCENT OF TILLABLE ACRES					
Owned	Percent	45	47	48	47
Cash Rented	Percent	51	49	46	49
Share Rented	Percent	4	4	6	4

In general, the 3 classes average fairly comparable size farms in nearly all size measures--number of cows, tillable acres, value of farm production, and total assets. The 71 Plus Debt to Asset Farms are the smallest in all measures except the number of cows, so they may have expanded cow numbers relative to facilities, land and labor, in an attempt to generate more cash flow.

In Table 9, Net Farm Earnings range from a high of \$22,267 in the Up To 40 debt to asset class to a negative (\$1,475) in the 71 Plus class. Total Net Earnings ranged in a similar pattern from \$7,671 to (\$13,888) as the class by debt to asset ratio increases. Return to Unpaid Labor & Management was negative across all debt to asset classes, but Return On Investment is positive for all debt to asset groups. Only the Up to .40 group showed a positive Return on Equity. Income statements by D/A Ratio are in Table 10.

Table 9: Income, Expense and Measures of Earnings for 114 Dairy Farms By Debt to Asset Ratios, Ohio, 1985.

DAIRY FARMS		DEBT AS A PERCENTAGE OF ASSETS			
Financial Characteristics	Unit	Up To 40	41-70	71 Plus	All Farm
INCOME					
Total Cash Income	\$	\$219,216	\$263,648	\$190,633	\$228,426
Other Income & Inv. Changes	\$	\$2,914	(\$9,455)	\$1,796	(\$1,799)
VALUE OF FARM PRODUCTION	\$	\$222,130	\$254,193	\$192,430	\$226,627
EXPENSE					
Total Variable Expense	\$	\$128,423	\$144,319	\$112,848	\$130,451
Total Fixed Expense	\$	\$71,440	\$98,587	\$81,056	\$83,484
TOTAL FARM EXPENSE	\$	\$199,863	\$242,915	\$193,904	\$213,935
EARNINGS					
Net Farm Earnings	\$	\$22,267	\$11,278	(\$1,475)	\$12,692
Net NonFarm Income	\$	\$6,958	\$3,928	\$8,572	\$6,251
NET EARNINGS	\$	\$29,225	\$15,206	\$7,097	\$18,943
Operator Labor Draw	\$	\$21,013	\$23,276	\$20,612	\$21,732
Income Tax	\$	\$542	\$475	\$374	\$478
TOTAL NET EARNINGS	\$	\$7,671	(\$8,544)	(\$13,888)	(\$3,267)
NET FARM EARNINGS	\$	\$22,267	\$11,278	(\$1,475)	\$12,692
RETURN TO UNPAID LABOR & MGT	\$	(\$15,025)	(\$15,016)	(\$6,663)	(\$13,041)
RETURN ON INVESTMENT	\$	\$21,553	\$30,454	\$20,099	\$24,410
RETURN TO EQUITY	\$	\$1,254	(\$11,998)	(\$22,086)	(\$9,040)

Table 10: Income Statement for 114 Dairy Farms By Debt to Asset Ratio, Ohio, 1985.

Income Statement	Unit	DEBT AS A PERCENTAGE OF ASSETS			
		Up To 40	41-70	71 Plus	All Farms
CASH INCOME					
Crops	\$	\$24,257	\$19,415	\$7,464	\$18,538
Hogs	\$	\$1,487	\$4,384	\$921	\$2,395
Dairy Products	\$	\$163,739	\$194,723	\$161,613	\$174,379
Dairy	\$	\$16,490	\$31,092	\$13,760	\$21,095
Beef	\$	\$3,218	\$1,120	\$1,100	\$1,962
Sheep	\$	\$12	\$48	\$1	\$23
CCC	\$	\$393	\$0	\$80	\$177
Other Farm Income	\$	\$9,620	\$12,866	\$5,694	\$9,857
TOTAL CASH INCOME	\$	\$219,216	\$263,648	\$190,633	\$228,426
Resale Purchases	\$	(\$838)	(\$529)	(\$346)	(\$610)
Breeder L.S. Purchases	\$	(\$2,847)	(\$4,997)	(\$3,902)	(\$3,870)
L.S. Inventory Change	\$	(\$77)	(\$9,973)	\$2,038	(\$3,135)
Crop & Feed Inv. Change	\$	\$6,500	\$6,243	\$3,664	\$5,736
Acct Rec Change	\$	(\$40)	(\$462)	\$160	(\$144)
Net Non-Cash Farm Inc	\$	\$205	\$263	\$182	\$220
L.S Pay/Futures Change	\$	\$12	\$0	\$0	\$5
VALUE OF FARM PROD.	\$	\$222,130	\$254,193	\$192,430	\$226,627
EXPENSE					
Variable Expense					
Wages	\$	\$19,471	\$17,439	\$13,460	\$17,316
Repair Machinery	\$	\$9,376	\$12,139	\$9,446	\$10,386
Feed	\$	\$26,763	\$36,510	\$28,008	\$30,564
Seed & Plants	\$	\$5,677	\$5,646	\$4,312	\$5,342
Fertilizer & Lime	\$	\$15,179	\$15,372	\$12,095	\$14,518
Spray & Chemicals	\$	\$6,880	\$5,038	\$4,096	\$5,558
Custom Hire	\$	\$2,519	\$2,530	\$3,219	\$2,689
Supplies	\$	\$6,265	\$7,022	\$5,361	\$6,323
Breeding	\$	\$2,457	\$2,512	\$2,086	\$2,389
Vet & Medicine	\$	\$4,267	\$5,196	\$4,107	\$4,563
Fuel & Lube	\$	\$8,237	\$9,258	\$7,205	\$8,360
Utilities	\$	\$4,885	\$5,844	\$4,837	\$5,219
Marketing	\$	\$5,834	\$7,377	\$3,305	\$5,790
Storage	\$	\$632	\$567	\$30	\$466
Other Than Above	\$	\$9,981	\$11,870	\$11,282	\$10,968
TOTAL VARIABLE EXPENSE	\$	\$128,423	\$144,319	\$112,848	\$130,451
Fixed Expense					
Interest	\$	\$20,299	\$42,453	\$42,186	\$33,450
Taxes	\$	\$3,775	\$3,486	\$2,801	\$3,440
Lease Payments	\$	\$10,428	\$15,577	\$9,263	\$12,004
Insurance	\$	\$4,106	\$4,186	\$2,685	\$3,799
Building Repairs	\$	\$2,366	\$1,534	\$1,387	\$1,835
Building Depreciation	\$	\$8,924	\$12,583	\$9,622	\$10,405
Equipment Depreciation	\$	\$21,542	\$18,777	\$13,113	\$18,551
TOTAL FIXED EXPENSE	\$	\$71,440	\$98,597	\$81,056	\$83,484
TOTAL FARM EXPENSE	\$	\$199,863	\$242,915	\$193,904	\$213,935
NET FARM EARNINGS	\$	\$22,267	\$11,278	(\$1,475)	\$12,692

Table 11: Balance Sheet Data on 114 Dairy Farms By Debt to Asset Ratios, Ohio, 1985.

DAIRY FARMS		DEBT AS A PERCENTAGE OF ASSETS			
Balance Sheet Information	Unit	Up To 40	41-70	71 Plus	All Farms
BALANCE SHEET DATA					
Current Assets	\$1,000	103.3	106.9	72.0	97.2
Current Liabilities	\$1,000	37.5	65.2	70.4	55.3
Current Equity	\$1,000	65.8	41.7	1.6	41.9
Intermediate Assets	\$1,000	264.1	305.6	232.8	271.6
Inter. Liabilities	\$1,000	42.8	110.0	79.5	75.6
Inter. Equity	\$1,000	221.3	195.6	153.4	196.0
Fixed Assets	\$1,000	447.5	482.3	319.5	429.7
Fixed Liabilities	\$1,000	113.0	281.4	388.0	238.7
Fixed Equity	\$1,000	334.5	200.9	-68.5	191.0
Total Assets	\$1,000	814.8	894.7	624.3	798.5
Total Liabilities	\$1,000	193.3	456.5	537.8	369.6
Total Equity	\$1,000	621.5	438.2	86.5	428.9
Change in Equity, 1984-5	\$1,000	8.1	-8.7	-11.7	-2.6
FINANCIAL PERFORMANCE MEASURES					
Liquidity Ratios					
Current Ratio (CA/CL)	Ratio	2.75	1.64	1.02	1.76
CurrLiab/TotLiab (CL/TL)	Ratio	.19	.14	.13	.15
Inter. (CA+IA)/(CL+IL)	Ratio	4.57	2.36	2.03	2.82
Solvency Ratios					
Debt/Asset(D/A)or(TL/TA)	Ratio	.24	.51	.86	.46
Equity Ratio (TE/TL)	Ratio	.76	.49	.14	.54
Leverage Ratio (TL/TE)	Ratio	.31	1.04	6.22	.86
Profitability					
Net Farm Earnings as % of Average Farm Assets	\$	2.98	1.34	-.26	1.71

Table 11 shows the financial performance measures for the dairy farms. The 71 Plus class has a Leverage ratio of 6.22 which means they have 6.22 times as much debt as they do equity with a Current Ratio of only 1.02 and Equity Ratio of .14. Net Farm Earnings as a percent of Average Farm Assets ranged from 2.98 down to -.26% and Change in Equity ranged from \$8,100 to (\$11,700) as debt to asset ratios increased.

The classes of farms with high D/A ratios had the highest Turnover Ratio, Net Profit Margin, and Return To Investment (Table 12). However, the 71 Plus class had a -25.54% return on equity and a -16.06% rate of growth in equity, rates at which in only 4 to 6 years would result in bankruptcy. Interest expense represents nearly 22% of the Value of Farm Production on the 71 Plus group of farms, compared to only 9% on farms with Up To 40 D/A ratios, a difference of 13%. This is nearly the same spread in Net Farm Earnings with 10.02 for the Up to 40 class and -.77 for the 71 Plus class. Variable Expenses are fairly similar for the D/A Ratio classes, but the percentage of Fixed Expenses increases as the farms are grouped by higher D/A Ratios. Fixed Expense is only 32% of the Value of Production on the Up To 40 D/A class farms, and over 42% on the 71 Plus D/A class farms.

Table 12: Measures of Financial Efficiency on 114 Dairy Farms
By Debt to Asset Ratio, Ohio, 1985.

DAIRY FARMS		DEBT AS A PERCENTAGE OF ASSETS			
Efficiency Measures	Unit	Up To 40	41-70	71 Plus	All Farms
FINANCIAL EFFICIENCY					
Turnover Ratio	Ratio	.30	.30	.33	.31
Debt Service Ratio	Ratio	9.18	16.27	29.30	16.09
PROFITABILITY					
Net Profit Margin	Percent	9.70	11.98	10.45	10.77
Return on Investment	Percent	2.88	3.61	3.49	3.29
Return on Equity	Percent	.20	-2.74	-25.54	-2.11
Rate of Growth in Equity	Percent	1.23	-1.95	-16.06	-.76
EXPENSE AND EARNINGS AS A PERCENT OF VALUE OF FARM PRODUCTION					
Interest	Percent	9.14	16.70	21.92	14.76
Depreciation	Percent	13.72	12.34	11.81	12.78
Other Operating Exp	Percent	67.12	66.52	67.03	66.86
Net Farm Earnings	Percent	10.02	4.44	-.77	5.60
Total	Percent	100.00	100.00	100.00	100.00
TOTAL EXPENSE AS A PERCENTAGE OF VALUE OF FARM PRODUCTION					
Variable Expense	Percent	57.81	56.78	58.64	57.56
Fixed Expense	Percent	32.16	38.79	42.12	36.84
Total	Percent	89.98	95.56	100.77	94.40

In Table 13, the 41-70 D/A Ratio class has the highest Value of Total Production Per Tillable Acre at \$647. The 71 Plus group has the lowest Value of Crop Production per tillable acre at \$22 coupled with the highest Fixed Expense at \$245 per tillable

acre. The .41-.70 class has the highest Total Expense at \$596 while the Up To 40 debt to asset class has the lowest Variable, Fixed and Total Expense Per Tillable Acre at \$472 per acre.

Table 13: Efficiency Measures and Cost per Tillable Acre on 114 Dairy Farms By Debt to Asset Ratios, Ohio, 1985.

DAIRY FARMS		DEBT AS A PERCENTAGE OF ASSETS			
Efficiency Measures	Unit	Up To 40	41-70	71 Plus	All Farms
PRODUCTION EFFICIENCY PER TILLABLE ACRE					
Value of Crop Prod./T.A.	\$/A	\$57.22	\$47.67	\$22.56	\$46.83
Value of Total Prod./T.A.	\$/A	\$517.15	\$647.32	\$576.12	\$576.99
Variable Expense Per T.A.	\$/A	\$302.96	\$354.34	\$341.04	\$329.51
Fixed Expense Per T.A.	\$/A	\$168.53	\$242.08	\$244.96	\$210.87
Total Expense Per T.A.	\$/A	\$471.50	\$596.41	\$586.01	\$540.38
Machinery Investment/T.A.	\$/A	\$282.00	\$328.54	\$263.68	\$295.59
Machinery Cost Per T. A.					
Repair Machinery	\$/A	\$22.12	\$29.80	\$28.55	\$26.23
Custom Hire	\$/A	\$5.94	\$6.21	\$9.73	\$6.79
Lube & Fuel Cost	\$/A	\$19.43	\$22.73	\$21.77	\$21.12
Equipment Depreciation	\$/A	\$50.82	\$46.10	\$39.63	\$46.86
Machinery Invest @7.5%	\$/A	\$21.15	\$24.64	\$19.78	\$22.17
Machinery Cost Per T.A.	\$/A	\$119.46	\$129.49	\$119.45	\$123.17
Seed & Plant Cost Per T.A.	\$/A	\$13.39	\$13.86	\$13.03	\$13.49
Fert. & Lime Cost Per T.A.	\$/A	\$35.81	\$37.74	\$36.55	\$36.67
Spray & Chem Cost Per T.A.	\$/A	\$16.23	\$12.37	\$12.38	\$14.04
CAPITAL INVESTMENT					
Feed & Crop Capital	\$	\$64,220	\$65,835	\$48,909	\$61,174
Livestock Capital	\$	\$126,701	\$159,094	\$133,061	\$139,857
Machinery Capital	\$	\$119,537	\$133,812	\$87,250	\$117,024
Land & Building Cap	\$	\$406,630	\$436,740	\$284,926	\$388,635
Other Capital	\$	\$30,784	\$48,342	\$21,405	\$34,877
TOTAL FARM ASSETS	\$	\$747,871	\$843,823	\$575,552	\$741,568

Dairy production efficiency measures are shown in Table 14. The high D/A Ratio farms did not perform well here as the 71 Plus class has the lowest Milk Production Per Cow at 14,118 pounds, lowest Milk Sales Per Cow at \$1,838, and the lowest Returns Per \$100 Feed Fed at \$181. The Up To 40 debt to asset class has the highest Milk Production Per Cow at 16,045 pounds, the highest Milk Sales Per Cow at \$2,046, and one of the highest Returns above feed fed at \$1,137, Returns Per \$100 Feed Fed at \$214.

Total Debt Per Cow ranges from a low of \$2,416 for the Up to 40 debt to asset class to \$6,117 for the 71 Plus class.

Table 14: Dairy Production Measures on 114 Dairy Farms By Debt to Asset Ratios, Ohio, 1985

DAIRY FARMS		DEBT AS A PERCENTAGE OF ASSETS			
Efficiency Measures	Unit	Up To 40	41-70	71 Plus	All Farms
NUMBER OF FARMS	Number	46	41	27	114
NO. OF DAIRY COWS	HEAD	80	99	88	89
TOTAL MILK PRODUCTION	CWT.	12,836	14,928	12,413	13,489
MILK PRODUCTION PER COW	LBS.	16,045	15,149	14,118	15,234
MILK SALES PER COW	\$/COW	\$2,046	\$1,976	\$1,838	\$1,969
TOTAL RETURNS PER COW	\$/COW	\$2,138	\$2,145	\$1,957	\$2,098
TOTAL DEBT PER COW	\$/COW	\$2,416	\$4,633	\$6,117	\$4,174
SALES OF DAIRY PRODUCTS	\$	\$163,740	\$194,723	\$161,613	\$174,379
SALES OF DAIRY ANIMALS	\$	\$16,490	\$31,032	\$13,761	\$21,074
OTHER DAIRY INCOME	\$	(\$9,133)	(\$14,441)	(\$3,271)	(\$9,654)
TOTAL DAIRY RETURNS	\$	\$171,097	\$211,314	\$172,103	\$185,799
HAY	\$/COW	\$189	\$177	\$173	\$181
CORN SILAGE	\$/COW	\$95	\$158	\$123	\$127
GRASS SILAGE	\$/COW	\$5	\$7	\$0	\$5
HAYLAGE	\$/COW	\$190	\$139	\$203	\$173
CONCENTRATES	\$/COW	\$258	\$264	\$315	\$274
PURCHASED FEED	\$/COW	\$264	\$249	\$267	\$259
TOTAL VALUE OF FEED FED	\$/COW	\$1,001	\$994	\$1,081	\$1,017
RETURNS ABOVE FEED FED/COW	\$/COW	\$1,137	\$1,150	\$876	\$1,081
RETURNS PER \$100 FEED FED	\$/100	\$214	\$216	\$181	\$206
NET FARM EARNINGS	\$	\$22,267	\$11,278	(\$1,475)	\$12,692

HIGHLIGHTS -- DAIRY FARMS BY NET FARM EARNINGS

Overview of Farms Summarized

Table 15 through 21 show similiar information for the farms sorted by net farm earnings. The top 1/3 dairy farms had the most dairy cows at 111, the most tillable acres at 501, and the highest Value of Farm Production at \$314,160, almost double the value of the other two classes. The top 1/3 farms also had more total assets and equity and less debt with a debt to asset ratio of .37 compared to .54 for the bottom group. The middle 1/3 farms had the least number of dairy cows at 70, the fewest tillable acres at 337, the lowest Value of Farm Production at \$175,708, and considerably less total assets. The top 1/3 farms were more efficient in crop production with higher yields in corn, wheat, soybeans, and corn silage compared to the other classes. The bottom 1/3 group owned more land at 54% and cash rented less land at 39% while the top 1/3 farms owned less land at 43% and cash rented more land at 52%.

Measures of Earnings

In Table 16, Net Farm Earnings range from a high of \$54,731 in the top 1/3 farms to a negative (\$30,662) in the bottom 1/3 farms. Total Net Earnings ranged in a similar pattern from \$30,033 to (\$39,260) from the top 1/3 to the bottom 1/3 farms by net farm earnings. Return to Labor & Management, Return On Investment, and Return on Equity was positive for the top 1/3 farms and negative for the bottom 1/3 farms. Income statements by Net Farm Earnings are in Table 17.

Balance Sheet Ratios

The balance sheet data shows that the top 1/3 and middle 1/3 farms sorted by net farm earnings have stable liquidity ratios with a current ratio of 2.20 and 2.37 and intermediate ratios of 3.53 and 2.66, above the desired level of at least 2.0. The top 1/3 farms are less heavily leveraged at .60 while the bottom 1/3 farms have twice as much leverage at 1.18. The top 1/3 farms gained \$29,700 in equity change while the bottom 1/3 farms lost \$39,800 in equity.

Table 15: Number of Farms, Crop Yields, and Measures of Size for 114 Dairy Farms By Net Farm Earnings, Ohio, 1985.

DAIRY FARMS Size Characteristics	NET FARM EARNINGS				
	Unit	Top 1/3	Middle 1/3	Bottom 1/3	All Farms
NUMBER OF FARMS	Number	38	38	38	114
NUMBER OF DAIRY COWS	HEAD	111	70	85	89
TOTAL TILLABLE	Acres	501	337	350	396
VALUE OF FARM PRODUCTION	\$	\$314,160	\$175,708	\$190,014	\$226,627
BALANCE SHEET DATA					
Total Assets	\$1,000	941.1	617.6	836.6	790.5
Total Liabilities	\$1,000	352.5	302.6	453.6	369.6
Total Equity	\$1,000	588.6	315.0	383.0	428.9
CROP YIELDS					
Corn	Bu./A.	135	108	124	123
Soybeans	Bu./A.	45	40	39	42
Wheat	Bu./A.	59	50	57	56
Corn Silage	Ton/A.	22	16	19	17
Hay	Ton/A.	2.9	2.8	3.1	2.9
CROP ACRES					
Corn	Acre	234	135	214	183
Soybeans	Acre	169	151	89	135
Wheat	Acre	33	29	38	33
Corn Silage	Acre	19	42	38	40
Hay	Acre	113	109	101	135
ACREAGE					
Total Owned	Acres	292	184	247	241
Tillable Owned	Acres	215	148	190	184
Tillable Cash Rented	Acres	259	185	138	194
Tillable Share Rent	Acres	26	4	22	17
TOTAL TILLABLE	Acres	501	337	350	396
PERCENT OF TILLABLE ACRES					
Owned	Percent	43	44	54	47
Cash Rented	Percent	52	55	39	49
Share Rented	Percent	5	1	6	4

Table 16: Income, Expense and Measures of Earnings for 114 Dairy Farms
By Net Farm Earnings, Ohio, 1985.

DAIRY FARMS Financial Characteristics	NET FARM EARNINGS				
	Unit	Top 1/3	Middle 1/3	Bottom 1/3	All Farms
INCOME					
Total Cash Income	\$	\$297,059	\$172,577	\$215,643	\$228,426
Other Income & Inv. Changes	\$	\$17,101	\$3,131	(\$25,629)	(\$1,799)
VALUE OF FARM PRODUCTION	\$	\$314,160	\$175,708	\$190,014	\$226,627
EXPENSES					
Total Variable Expense	\$	\$164,843	\$98,158	\$128,352	\$130,451
Total Fixed Expense	\$	\$94,586	\$63,542	\$92,325	\$83,484
TOTAL FARM EXPENSE	\$	\$259,429	\$161,701	\$220,677	\$213,935
EARNINGS					
Net Farm Earnings	\$	\$54,731	\$14,007	(\$30,662)	\$12,692
Net NonFarm Income	\$	\$3,020	\$6,038	\$9,694	\$6,251
NET EARNINGS	\$	\$57,751	\$20,045	(\$20,968)	\$18,943
Operator Labor Draw	\$	\$26,867	\$20,263	\$18,065	\$21,732
Income Tax	\$	\$850	\$357	\$226	\$478
TOTAL NET EARNINGS	\$	\$30,033	(\$574)	(\$39,260)	(\$3,267)
NET FARM EARNINGS	\$	\$54,731	\$14,007	(\$30,662)	\$12,692
RETURN TO UNPAID LABOR & MGT	\$	\$19,413	(\$4,893)	(\$53,644)	(\$13,041)
RETURN ON INVESTMENT	\$	\$60,513	\$19,664	(\$6,946)	\$24,410
RETURN TO EQUITY	\$	\$27,863	(\$6,255)	(\$48,728)	(\$9,040)

Table 17: Income Statement for 114 Dairy Farms By Net Farm Earnings, Ohio, 1985.

DAIRY FARMS Income Statement	NET FARM EARNINGS				
	Unit	Top 1/3	Middle 1/3	Bottom 1/3	All Farms
CASH INCOME					
Crops	\$	\$22,514	\$16,503	\$16,597	\$18,538
Hogs	\$	\$2,761	\$2,884	\$1,539	\$2,395
Dairy Products	\$	\$236,010	\$131,611	\$155,517	\$174,379
Dairy	\$	\$22,080	\$13,111	\$28,095	\$21,095
Beef	\$	\$2,169	\$842	\$2,875	\$1,962
Sheep	\$	\$67	\$1	\$0	\$23
CCC	\$	\$476	\$0	\$57	\$177
Other Farm Income	\$	\$10,983	\$7,626	\$10,963	\$9,857
TOTAL CASH INCOME	\$	\$297,059	\$172,577	\$215,643	\$228,426
Resale Purchases	\$	(\$393)	(\$1,088)	(\$351)	(\$610)
Breeder L.S. Purchases	\$	(\$4,028)	(\$3,333)	(\$4,249)	(\$3,870)
L.S. Inventory Change	\$	\$8,729	\$2,407	(\$20,542)	(\$3,135)
Crop & Feed Inv. Change	\$	\$12,155	\$5,335	(\$283)	\$5,736
Acct Rec Change	\$	\$394	(\$417)	(\$411)	(\$144)
Net Non-Cash Farm Inc	\$	\$229	\$226	\$206	\$220
L.S Pay/Futures Change	\$	\$15	\$0	\$0	\$5
VALUE OF FARM PROD.	\$	\$314,160	\$175,708	\$190,014	\$226,627
EXPENSES					
Variable Expense					
Wages	\$	\$21,728	\$12,577	\$17,644	\$17,316
Repair Machinery	\$	\$12,264	\$7,938	\$10,956	\$10,386
Feed	\$	\$38,128	\$21,278	\$32,285	\$30,564
Seed & Plants	\$	\$7,046	\$4,207	\$4,774	\$5,342
Fertilizer & Lime	\$	\$19,369	\$11,411	\$12,774	\$14,518
Spray & Chemicals	\$	\$7,777	\$4,486	\$4,411	\$5,558
Custom Hire	\$	\$2,875	\$2,662	\$2,529	\$2,689
Supplies	\$	\$7,131	\$5,291	\$6,547	\$6,323
Breeding	\$	\$3,276	\$1,824	\$2,066	\$2,389
Vet & Medicine	\$	\$6,202	\$2,934	\$4,553	\$4,563
Fuel & Lube	\$	\$10,200	\$6,639	\$8,240	\$8,360
Utilities	\$	\$6,638	\$3,695	\$5,323	\$5,219
Marketing	\$	\$8,231	\$4,445	\$4,695	\$5,790
Storage	\$	\$683	\$430	\$285	\$466
Other Than Above	\$	\$13,295	\$8,342	\$11,269	\$10,968
TOTAL VARIABLE EXPENSE	\$	\$164,843	\$98,158	\$128,352	\$130,451
Fixed Expense					
Interest	\$	\$32,651	\$25,919	\$41,782	\$33,450
Taxes	\$	\$4,362	\$2,481	\$3,478	\$3,440
Lease Payments	\$	\$14,607	\$9,503	\$11,903	\$12,004
Insurance	\$	\$4,296	\$2,878	\$4,222	\$3,799
Building Repairs	\$	\$2,770	\$1,156	\$1,577	\$1,835
Building Depreciation	\$	\$11,785	\$6,463	\$12,968	\$10,405
Equipment Depreciation	\$	\$24,115	\$15,143	\$16,395	\$18,551
TOTAL FIXED EXPENSE	\$	\$94,586	\$63,542	\$92,325	\$83,484
TOTAL FARM EXPENSE	\$	\$259,429	\$161,701	\$220,667	\$213,935
NET FARM EARNINGS	\$	\$54,731	\$14,007	(\$30,662)	\$12,692

Table 18: Balance Sheet Data on 114 Dairy Farms By Net Farm Earnings, Ohio, 1985.

DAIRY FARMS Balance Sheet Information	NET FARM EARNINGS				
	Unit	Top 1/3	Middle 1/3	Bottom 1/3	All Farms
BALANCE SHEET DATA					
Current Assets	\$1,000	119.4	88.5	85.8	97.2
Current Liabilities	\$1,000	54.3	37.3	74.1	55.3
Current Equity	\$1,000	65.1	51.0	9.6	41.9
Intermediate Assets	\$1,000	337.9	215.0	261.9	271.6
Inter. Liabilities	\$1,000	75.2	76.8	74.9	75.6
Inter. Equity	\$1,000	262.7	138.2	187.0	196.0
Fixed Assets	\$1,000	483.8	314.3	490.9	429.7
Fixed Liabilities	\$1,000	223.0	188.5	304.5	238.7
Fixed Equity	\$1,000	260.8	125.8	186.4	191.0
Total Assets	\$1,000	941.1	617.6	836.6	798.5
Total Liabilities	\$1,000	352.5	302.6	453.6	369.6
Total Equity	\$1,000	588.6	315.0	383.0	428.9
Change in Equity, 1984-5	\$1,000	29.7	2.2	-39.8	-2.6
FINANCIAL PERFORMANCE MEASURES					
Liquidity Ratios					
Current Ratio (CA/CL)	Ratio	2.20	2.37	1.13	1.76
CurrLiab/TotLiab (CL/TL)	Ratio	.15	.12	.16	.15
Inter. (CA+IA)/(CL+IL)	Ratio	3.53	2.66	2.32	2.82
Solvency Ratios					
Debt/Asset(D/A)or(TL/TA)	Ratio	.37	.49	.54	.46
Equity Ratio (TE/TL)	Ratio	.63	.51	.46	.54
Leverage Ratio (TL/TE)	Ratio	.60	.96	1.18	.86
Net Farm Earnings as a Percent of Average Farm Assets					
	\$	6.36	2.52	-3.79	1.71

Measures of Financial Efficiency

The top 1/3 dairy farms had 36 cents in sales for each dollar in investment (Table 19) compared to the bottom 1/3 farms with only 24 cents in sales for each dollar invested. The top 1/3 farms also had double the Net Profit Margin at 19.26, double the Return on Investment at 7.03, and the the only positive Return on Equity at 4.73 compared to the average farm. The bottom 1/3 farms had a negative Rate of growth in Equity of -10.25% while the top 1/3 farms grew at a positive 5.10%.

The top 1/3 farms also reported lower expenses in each of the four categories that equal the Value of Farm Production. The top 1/3 farms had only 10% in interest expense, 11% for depreciation, and 61% in operating expense for a positive 17% net farm earnings while the bottom 1/3 farms had 22% interest expense, 15% depreciation, and 79% operating expense for a negative -16% net farm earnings. The bottom 1/3 farms have much higher variable expense, fixed, and total expense at 67%, 49%, and 116% compared to the average of only 57% variable expense, 37% fixed expense, and 94% total expense. The top 1/3 farms are below the average with 52% variable expense, 30% fixed expense, and 83% total expense.

Table 19: Measures of Financial Efficiency on 114 Dairy Farms
By Net Farm Earnings, Ohio, 1985.

DAIRY FARMS Efficiency Measures	Unit	NET FARM EARNINGS			
		Top 1/3	Middle 1/3	Bottom 1/3	All Farm
FINANCIAL EFFICIENCY					
Turnover Ratio	Ratio	.36	.32	.24	.31
Debt Service Ratio	Ratio	9.43	22.76	20.92	16.09
PROFITABILITY					
Net Profit Margin	Percent	19.26	11.19	-3.66	10.77
Return on Investment	Percent	7.03	3.54	-.86	3.29
Return on Equity	Percent	4.73	-1.99	-12.72	-2.11
Rate of Growth in Equity	Percent	5.10	-.18	-10.25	-.76
EXPENSE AND EARNINGS AS A PERCENT OF VALUE OF FARM PRODUCTION					
Interest	Percent	10.39	14.75	21.99	14.76
Depreciation	Percent	11.43	12.30	15.45	12.78
Other Operating Exp	Percent	60.76	64.98	78.70	66.86
Net Farm Earnings	Percent	17.42	7.97	-16.14	5.60
Total	Percent	100.00	100.00	100.00	100.00
TOTAL EXPENSE AS A PERCENTAGE OF VALUE OF FARM PRODUCTION					
Variable Expense	Percent	52.47	55.86	67.55	57.56
Fixed Expense	Percent	30.11	36.16	48.59	36.84
Total	Percent	82.58	92.03	116.14	94.40

Efficiency and Cost Measures Per Tillable Acre

The bottom 1/3 farms had the highest Value of Total Production per tillable are at \$616. but also the highest Total expense at \$630 per acre, Machinery Investment per acre at \$313, and Machine cost at \$132. The middle 1/3 farms had the lowest Value of Total Production at \$512 but also the lowest Total expense at \$480 and Machine cost per tillable acre at \$118. The top 1/3 farms spend slightly more money in seed & plant, fertilizer & lime, and spray & chemicals than the average farms which may account for its higher yields.

Table 20: Efficiency Measures and Cost per Tillable Acre on 114 Dairy Farms By Net Farm Earnings, Ohio, 1985.

Efficiency Measures	NET FARM EARNINGS				
	Unit	Top 1/3	Middle 1/3	Bottom 1/3	All Farms
PRODUCTION EFFICIENCY PER TILLABLE ACRE					
Value of Crop Prod./T.A.	\$/A	\$44.97	\$48.97	\$47.42	\$46.83
Value of Total Prod./T.A.	\$/A	\$593.37	\$512.06	\$616.08	\$576.99
Variable Expense Per T.A.	\$/A	\$329.27	\$291.25	\$366.69	\$329.51
Fixed Expense Per T.A.	\$/A	\$188.93	\$188.54	\$263.76	\$210.87
Total Expense Per T.A.	\$/A	\$518.20	\$479.79	\$630.46	\$540.38
Machinery Investment/T.A.	\$/A	\$280.48	\$299.48	\$313.46	\$295.59
Machinery Cost Per T. A.					
Repair Machinery	\$/A	\$24.50	\$23.55	\$31.30	\$26.23
Custom Hire	\$/A	\$5.74	\$7.90	\$7.23	\$6.79
Lube & Fuel Cost	\$/A	\$20.37	\$19.70	\$23.54	\$21.12
Equipment Depreciation	\$/A	\$48.17	\$44.93	\$46.84	\$46.86
Machinery Invest @7.5%	\$/A	\$21.04	\$22.46	\$23.51	\$22.17
Machinery Cost Per T.A.	\$/A	<u>\$119.82</u>	<u>\$118.54</u>	<u>\$132.42</u>	<u>\$123.17</u>
Seed & Plant Cost Per T.A.	\$/A	\$14.07	\$12.48	\$13.64	\$13.49
Fert. & Lime Cost Per T.A.	\$/A	\$38.69	\$33.86	\$36.49	\$36.67
Spray & Chem Cost Per T.A.	\$/A	\$15.54	\$13.31	\$12.60	\$14.04
CAPITAL INVESTMENT					
Feed & Crop Capital	\$	\$78,111	\$51,518	\$53,895	\$61,174
Livestock Capital	\$	\$166,152	\$105,879	\$147,541	\$139,857
Machinery Capital	\$	\$140,417	\$100,934	\$109,720	\$117,024
Land & Building Cap	\$	\$440,011	\$271,113	\$454,781	\$388,635
Other Capital	\$	\$36,210	\$26,212	\$42,211	\$34,877
TOTAL FARM ASSETS	\$	\$860,901	\$555,655	\$808,147	\$741,568

Efficiency and Cost Measures Per Cow

The larger dairy farms tend to be in the top 1/3 farms with a larger number of cows at 111 while the smaller dairy farms tend to be in the middle 1/3 with 70 cows per farm. The top 1/3 farms produced almost twice as much milk at 1,851,800 total pounds compared to the middle 1/3 farms with 1,003,000 total pounds. The top 1/3 farms also had superior milk production per cow at 16,714 pounds per cow compared to only 14,372 and 14,012 respectively for the middle and bottom 1/3 dairy farms. The top 1/3 farms also had superior Milk sales per cow at \$2,130 and Total returns per cow at \$2,342 compared to the other farms. Debt per cow increased from \$3,182 for the top 1/3 farms to \$5,333 for the bottom 1/3 farms. The middle 1/3 farms had the lowest Total value of feed fed at \$920 and the highest Return per \$100 of feed fed at \$223. The top 1/3 farms had the highest Total feed expense at \$1,066 per cow and Returns above feed fed at \$1,275. The bottom 1/3 farms had the lowest Returns above feed fed at \$785 and lowest Returns per \$100 feed fed at \$176.

Table 21: Dairy Production Measures on 114 Dairy Farms By Net Farm Earnings, Ohio, 1985.

DAIRY FARMS	NET FARM EARNINGS				
	Unit	Top 1/3	Middle 1/3	Bottom 1/3	All Farms
Efficiency Measures	Unit	Top 1/3	Middle 1/3	Bottom 1/3	All Farms
NUMBER OF FARMS	Number	38	38	38	114
NO. OF DAIRY COWS	HEAD	111	70	85	89
TOTAL MILK PRODUCTION	CWT.	18,518	10,030	11,918	13,489
MILK PRODUCTION PER COW	LBS.	16,714	14,372	14,012	15,234
MILK SALES PER COW	\$/COW	\$2,130	\$1,886	\$1,828	\$1,969
TOTAL RETURNS PER COW	\$/COW	\$2,342	\$2,054	\$1,818	\$2,098
TOTAL DEBT PER COW	\$/COW	\$3,182	\$4,336	\$5,333	\$4,174
SALES OF DAIRY PRODUCTS	\$	\$236,010	\$131,611	\$155,516	\$174,379
SALES OF DAIRY ANIMALS	\$	\$22,080	\$13,047	\$28,095	\$21,074
OTHER DAIRY INCOME	\$	\$1,332	(\$1,316)	(\$28,977)	(\$9,654)
TOTAL DAIRY RETURNS	\$	\$259,421	\$143,342	\$154,635	\$185,799
HAY	\$/COW	\$175	\$181	\$189	\$191
CORN SILAGE	\$/COW	\$122	\$116	\$143	\$127
GRASS SILAGE	\$/COW	\$7	\$0	\$5	\$5
HAYLAGE	\$/COW	\$186	\$150	\$174	\$173
CONCENTRATES	\$/COW	\$313	\$232	\$257	\$274
PURCHASED FEED	\$/COW	\$264	\$242	\$265	\$259
TOTAL VALUE OF FEED FED	\$/COW	\$1,066	\$920	\$1,033	\$1,017
RETURNS ABOVE FEED FED/COW	\$/COW	\$1,275	\$1,133	\$785	\$1,081
RETURNS PER \$100 FEED FED	\$/100	\$220	\$223	\$176	\$206
NET FARM EARNINGS	\$	\$54,731	\$14,007	(\$30,662)	\$12,692

DISTRIBUTION OF FARMS BY SIZE, DEBT TO ASSET, AND NET FARM EARNINGS

The number of farms in each category sorted by both number of cows and debt to asset ratios is shown in Table 22. Of primary interest is whether any size class of farms is experiencing the greatest financial difficulty. Thus we reported the data with emphasis on percent of farms by size class in each D/A class. The 20-39 and 40-59 dairy farms are fairly evenly distributed over each debt to asset ratio. The 60-79 dairy farms are over represented in the Up to 30 debt to asset class and the 80-199 are over represented in the 71 Plus class and under represented in the 41-70 class. The 120 Plus dairy farms fall mostly in the 40-71 D/A class and are under represented in the other two classes.

In Table 23, the farms are sorted by the number of cows and net farm earnings. The top 1/3 farms are over represented mainly by the 120 Plus and 60-79 dairy farms. The 20-39, 40-59 and 80-119 dairy farms are over represented in the bottom 1/3 farms. The dairy farms with less than 80 cows are over represented in the middle 1/3 class. The 20-39 has only one farm in the top 1/3 farms with the majority of the farms in the middle 1/3 class. The 120 Plus dairy farms have the most number of farms in any category with 15 farms in the top 1/3 farms.

In Table 24, the farms are sorted by debt to asset ratios and net farm earnings. As expected, the top farms have are over represented in the lower debt to asset classes and under represented in the higher debt classes. The bottom 1/3 farms are over represented by the high debt loads and under represented by the low debt loads. Generally, it appears the larger farms with the low debt are doing the best with some of the smaller farms with low debt having someing problems surviving. The farms with the high debt loads are definitely having a hard time surviving although 5 farms out of 27 managed to be classified in the top 1/3 farms so it is possible to be profitable with a high debt load.

Table 22: Distribution of 114 Dairy Farms by Number of Cows and Debt to Asset Ratio, Ohio 1985.

DEBT TO ASSET RATIO	FARM SIZE IN NUMBER OF COWS					TOTAL
	20-39	40-59	60-79	80-119	120 Plus	
Up to 40	5 (11)	10 (22)	13 (28)	10 (22)	8 (17)	46 (100)
41 to 70	6 (15)	7 (17)	8 (20)	6 (15)	14 (34)	41 (100)
71 Plus	3 (11)	6 (22)	6 (22)	7 (26)	5 (19)	27 (100)
Total	14 (12)	23 (20)	27 (24)	23 (20)	27 (24)	114 (100)

Table 23: Distribution of 114 Dairy Farms by Number of Cows and Net Farm Earnings, Ohio 1985.

NET FARM EARNINGS	FARM SIZE IN NUMBER OF COWS					TOTAL
	20-39	40-59	60-79	80-119	120 Plus	
Top 1/3	1 (3)	4 (11)	10 (26)	8 (21)	15 (39)	38 (100)
Middle 1/3	8 (21)	10 (26)	10 (26)	5 (13)	5 (13)	38 (100)
Bottom 1/3	5 (13)	9 (24)	7 (18)	10 (26)	7 (18)	38 (100)
Total	14 (12)	23 (20)	27 (24)	23 (20)	27 (24)	114 (100)

Table 24: Distribution of 114 Dairy Farms by Debt to Asset and Net Farm Earnings, Ohio 1985.

NET FARM EARNINGS	DEBT TO ASSET RATIO			TOTAL
	Up to 40	41-70	71 Plus	
Top 1/3	21 (55)	12 (32)	5 (13)	38 (100)
Middle 1/3	15 (39)	14 (37)	9 (24)	38 (100)
Bottom 1/3	10 (26)	15 (39)	13 (34)	38 (100)
Total	46 (40)	41 (36)	27 (24)	114 (100)

GLOSSARY ---- Definitions arranged in alphabetical order.

CURRENT RATIO: Total current assets divided by total current liabilities.

DEBT to ASSET RATIO: Total liabilities divided by total assets.

DEBT SERVICE RATIO: Sum of Total Interest and Principal divided by the Value of Farm Production.

EQUITY RATIO: Total equity divided by total assets.

INTERMEDIATE CAPITAL RATIO: Current assets plus intermediate assets all divided by the sum of current liabilities and intermediate liabilities.

LEVERAGE RATIO: Total liabilities divided by total equity.

NET CAPITAL RATIO: Total assets divided by total equity.

NET FARM EARNINGS: Value of farm production minus total farm expense (including variable and fixed expense).

NET NON-FARM INCOME: Amount reported as off-farm income minus off-farm expenses other than operator draw or income tax.

NET PROFIT MARGIN: Net Farm Earnings plus interest paid minus unpaid labor all divided by value of farm production.

OPERATING EXPENSE: Total farm expense minus interest paid and depreciation expense.

OPERATOR LABOR DRAW: Amount reported as withdrawn from the cash flow for personal use.

RATE of GROWTH IN EQUITY: Net Earnings divided by total equity.

RETURN to EQUITY: Net Farm Earnings minus operator labor draw.

ROE RATIO: Return to Equity divided by average farm equity.

RETURN to INVESTMENT: Net Farm Earnings plus interest paid minus unpaid labor and management.

ROI RATIO: Return on Investment divided by average farm assets.

RETURN to UNPAID LABOR and MANAGEMENT: Net Farm Earnings minus 6% of total equity.

TOTAL Net Earnings: Total farm income plus non-farm income minus total farm expense and non-farm expense other than operator draw and income tax.

TURNOVER RATIO: Value of farm production divided by average farm assets.

VALUE of FARM PRODUCTION: The amount of cash farm income (including breeding livestock and resale sales) plus crop and livestock inventory changes and accounts receivable changes, minus breeding livestock and resale purchases.

