

Kentucky Farm Business Management Program

Dairy Annual Summary Data 2016



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A Special Note to Our Readers

The data for this study are drawn from the detailed financial and production records of producers cooperating with the Kentucky Farm Business Management Program. The data are not drawn from a random sample of farms in the state. However, these data are the most accurate and detailed farm financial data available to researchers and educators. Every attempt has been made to select a set of farms for these research studies which are “typical” operations and have complete financial information available for analysis. These data are carefully cross-checked by our farm management specialists before inclusion in this analysis. It should be noted that farms included in this study are representative of commercial farms producing major commodities and livestock, but not of all farms in Kentucky.

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Source of Data

This report presents the summarized 2016 performance data, both financial and physical, on 16 Kentucky farm businesses. Some data are presented for previous years so that trends and changes can be studied. This is the 50th annual summary of records obtained from farmers participating in the Kentucky Farm Business Management (KFBM) program. The program is a cooperative effort between the Department of Agricultural Economics of the University of Kentucky and four incorporated Farm Analysis Groups. This program was initiated to improve Kentucky farm management in general and specifically to:

- Provide farmers with an individual farm analysis and comparative analysis of farm business records emphasizing information necessary for sound decision making and wise financial planning;
- Provide farmers with objective counseling in developing priorities and alternative plans;
- Provide the public with basic information about business conditions as well as costs and returns on Kentucky farms under current conditions;
- Provide Kentucky farmers, teachers, researchers and lending agencies actual on-farm information about Kentucky farm businesses.

In 2016, 618 farmers on 368 farms were members of the Kentucky Farm Business Management program in 55 counties.

Uses for This Report

This annual summary is meant to be used as a reference for obtaining information about Kentucky farms. The results are therefore presented without interpretation. Throughout the year, Extension specialists and researchers will develop programs and publications that try to interpret the results and their implications. For more information, see <http://www.uky.edu/Ag/KFBM> for these Agricultural Economics - Extension Publications.

Managing a farm business is almost impossible without a complete set of farm records. Records such as those underlying the KFBM program provide the essential information required by lenders and tax preparers, and also provide the means for farmers to fully analyze their businesses. Analyzing this complete record gives an accurate evaluation of how profitable and efficient the business is, indicates the business' weak points and strong points, and provides reliable data (particularly physical production data) for use in planning.

The farm business summaries in this report are used by individual farmers to analyze their business operations and to develop future plans for their farming operations. This report summarizes information so that specialists in agricultural Extension, teaching, and research can use the data to enhance their programs. The definition of terms and income and expense measures below may provide assistance in using the data.

Farmers must be able to evaluate changes in their financial position. They must look at the interrelationships of the cash flow, income statement, and balance sheet to evaluate financial progress. For "real" progress to be made, the business must generate an increase in net worth as measured by a reconciled set of financial statements.

To thoroughly evaluate performance – to learn how the business is progressing – farmers need a record summary that includes considerable detail (i.e., production per person, yields per acre or head, feed conversion rates, etc.), and they must make trend and comparative analysis.

Trend analysis compares the farm's current year record summary with summaries from previous years. It allows farmers to identify trends and changes in their business over time and thereby detect improvements and deteriorations in various parts of the business.

Comparative analysis allows farmers to examine the similarities and differences in business performance between their farm and that of other similar farms. Comparative analysis is an important part of the work that Farm Business Management Specialists do with farmers in the program. The data presented here, however, can be useful to any farmer in Kentucky as a benchmark for performance.

Definition of Terms and Accounting Methods

Sampling Technique

Data from all farm business records certified to be usable for comparative analysis by field staff were aggregated by area, type of farm, size (i.e., tillable acres, number of animal production units, etc.), and management. Illinois Farm Business Farm Management Association's Farm Business Farm Management software was used to compile and summarize the data. It is important to note the farms represented in the KFBM dataset can change from year to year, and that fluctuations within the data could be due to this change of sample.

Type of Farm

Farm type is based on the percent feed fed. To determine percent feed fed, the total value of feed fed to all livestock enterprises is divided by the value of crop returns. However, tobacco revenue is excluded from crop returns for this calculation. Values for percent feed fed can range from zero to infinity. Large values are possible if a farm has limited grain production and thus purchases much of its feed.

Dairy farms are defined as farms on which the value of feed fed was more than 40 percent of the crop returns and the dairy enterprise utilized more than one-third of the value of feed fed.

Accrual Accounting

Accrual accounting matches the year's cost and returns to the farm's physical production. It differs from cash accounting, which records payments as made and income as received. For KFBM purposes, cash records are adjusted to approximate accrual accounting. Changes in inventories of commodities and livestock, accounts receivable, prepaid expenses, and accounts payable are added to or subtracted from cash income and expense records for the calendar or fiscal year. Accrual accounting provides a more realistic reflection of net farm income for the period as well as more accurate income statements and balance sheets in accordance with Farm Financial Standards Council recommendations.

Expense/Cost Items

Total operating expenses include cash operating expenses plus depreciation plus the net effect on expenses when accounting for the accrual change in accounts payable and prepaid expenses. Cash operating expenses include cash outlays for the following non-depreciable items:

- Fertilizer
- Pesticides
- Seed (including homegrown seed)
- Machinery repairs
- Machinery hire and leases
- Fuel and oil (lubricants)
- Farm share of utilities and light vehicle expenses
- Building repairs
- Drying and storage
- Hired labor
- Livestock expense
- Taxes
- Insurance
- Miscellaneous expenses

Purchased feed, grain, and livestock are not included because they are deducted from Gross Revenue to calculate the Value of Farm Production.

Depreciation used here is Economic Depreciation. It is calculated on each item using the Alternative Depreciation System (ADS) under the Modified Accelerated Cost Recovery System of the Internal Revenue Code of 1986. ADS imposes straight line depreciation over a longer cost recovery period than the General Depreciation System and other expense deductions allowed for income tax purposes.

Total interest expense includes cash interest paid on operating and term debt plus the net change in accrued interest on farm business debt.

Interest on equity capital is a charge of 3.07 percent on the current value of land and 5.33 percent on non-land items less total interest expense. It is the opportunity cost of investing in the farm business. The non-land charge is calculated by multiplying 5.33 percent times: 1) the average of the beginning and ending of year value of livestock, economic book value of machinery, and building investment; 2) one-half of the average of the beginning and ending of year balance of inventory items; and 3) one-half of the total year's cash operating expense.

Land Charge Total is the sum of land equity charge, real estate taxes, cash rent, and lease cost. Lease cost is the cost calculated to be paid by the landlord for the operator(s) share of acres paid less costs paid by the operator(s) for the landlord on share crop acres.

Unpaid family and operator labor is the opportunity cost of using the operator's own and unpaid family labor in the farm business. A charge of \$2,915 per month for unpaid operator and family labor is made for each farm. This labor charge is per labor month and is based on unpaid labor of 2,500 hours per year. Part-time family labor is therefore prorated. Like any other resource, unpaid labor must be accounted for when studying profitability of a farm business.

Revenue Items

Crop returns is the sum of the feed and grain sold, value of all feed fed (except milk), government crop subsidy program payments, and the change in value of feed and grain inventories less the value of crops and feed purchased. Tobacco revenue is excluded from crop returns for this calculation.

Livestock returns above feed is the sum of the sale of livestock and livestock products, value of livestock products consumed, and value of the livestock on hand at the end of the year minus livestock purchases and the value of the livestock on hand at the beginning of the year minus the cost of all feed fed, whether purchased or raised.

Gross farm returns is the sum of cash and accrued value of sales of farm products and services, government payments, and other farm-related revenue less the cost of purchased feed and livestock, plus the change in inventory value for grain and livestock, plus the value of farm products used. Farm products used are products consumed on farm and not sold. Also called *value of farm production*.

Net Farm Income is the value of farm production less total operating expenses, less total interest expense plus net gain or loss on machinery and buildings sold. Net Farm Income includes returns to the farm for unpaid family and operator labor, the interest on invested capital, and management. It is the net total earnings to the farm operator(s).

Operator(s) labor and management income is Net Farm Income less the interest charge on equity capital, less the opportunity cost of unpaid family labor. It represents the operators' return to their labor and management.

Management return is the residual after a charge for unpaid operator labor is deducted from operator(s) labor and management income.

Operator-only refers to the revenue, costs, production, and returns that accrue to the farmer(s) involved in the farm's management and NOT that of landlords.

Financial Efficiency Ratios

Expense Ratios are measures of how economically farm businesses operate. Each ratio compares some aspect of expense or Net Farm Income to gross farm returns.

Other Terms Used in this Report

Inventory value of crops and livestock is based on average year-end prices reported for the four KFBM areas in the Kentucky Department of Agriculture Market Reports, the USDA Agriculture Marketing Service reports, and other market sources.

Old Crop is any crop that was produced in a prior year, but inventoried and held for sell in the current year.

New Crop is any crop that was produced in the current year.

Hi 1/3 and Lo 1/3 refer to groupings by management returns. Thirds are the net of Gross Farm Returns less Total Non-Feed Cost.

Operator Acres is owned and cash rented acres plus the operator's share of tillable acres under crop share leases.

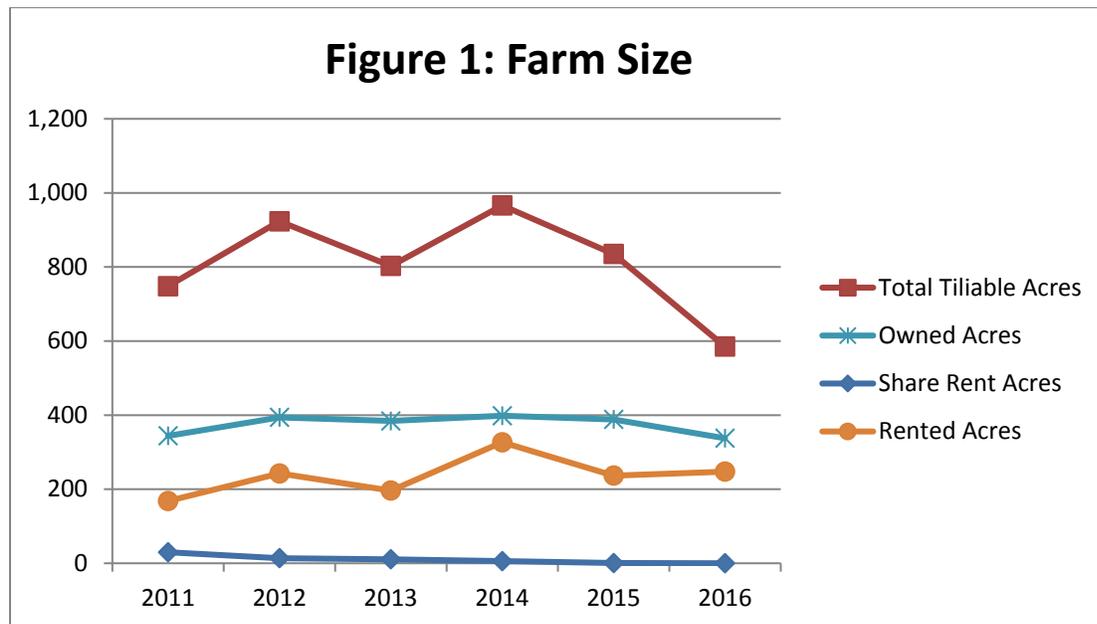
Pasture Days is the number of days the operator(s) reported that livestock derived a significant portion of nutrition from pasture. The charge to livestock for pasture days is the number of days multiplied times the number of animal units involved at a calculated cost of \$0.31/day for producing grass in pasture.

Total Acres Planted – Selected Crops is the total number of acres planted to a particular crop divided by the number of farms that planted that crop for all farms in a particular comparative sort.

Kentucky dairies experienced another down year in milk prices, so returns and income decreased for another year. This publication will go into further detail how KFBM dairies performed in areas as: farm size, milk production, milk price received, net farm income and management returns.

Farm Size and Farm Numbers

Kentucky Farm Business Management (KFBM) classifies a farm as a dairy when the value of feed fed is more than 40 percent of the crop returns and the dairy utilized more than one-third of the value of feed fed. Using that definition in 2016 there were 16 dairies in the data set, down from the previous year of 19 farms. One important part to remember when analyzing the data is that farms included in the averages are not necessarily the same farms from year to year. Average total acres dropped from 835 in 2015 to 585 acres in 2016. Total acres have significantly decreased since 2014 by 381 acres. (Figure 1) Total number of farms in the data set has gone from 25 farms in 2014 to 16 farms in 2016. There were eight farms with 200 cows or more and eight with 200 cows or less. Dairies with more than 200 cows had on average 888 total acres with 644 acres of tillable ground. Smaller dairies with less than 200 cows had on average a total of 282 acres with 228 acres being tillable.



Milk Production and Price

Milk production for KFBM farms and farms in the USDA state average has been steadily increasing over the past four years. In 2011 dairies, participating in the program produced on average 17,783 pounds of milk per cow. In 2016, the 16 dairies in KFBM average 21,805 pounds of milk per cow. Farms with more than 200 cows on average produced 22,505 pounds per cow, while farms with less than 200 cows produced 19,486 pounds per cow. When compared to USDA production, KFBM dairies produce 3,736 more pounds of milk per cow than Kentucky dairies. Information regarding USDA numbers can be found on their website. National production for 2016 was only 969 more pounds than dairies participating in KFBM. (Figure 2)

Not only have Kentucky dairies in KFBM producing more they also received a higher cost per hundredweight (cwt) of milk produced. On average, the price received was \$17.83 per cwt of milk for dairies on the program. The USDA reported slightly lower price at \$17.20 per cwt of milk for 2016. (Figure 3) Looking closer at dairies utilizing KFBM, those farms with more than 200 cows the price received per cwt was \$17.46 while farms with fewer than 200 cows received \$19.26 per cwt.

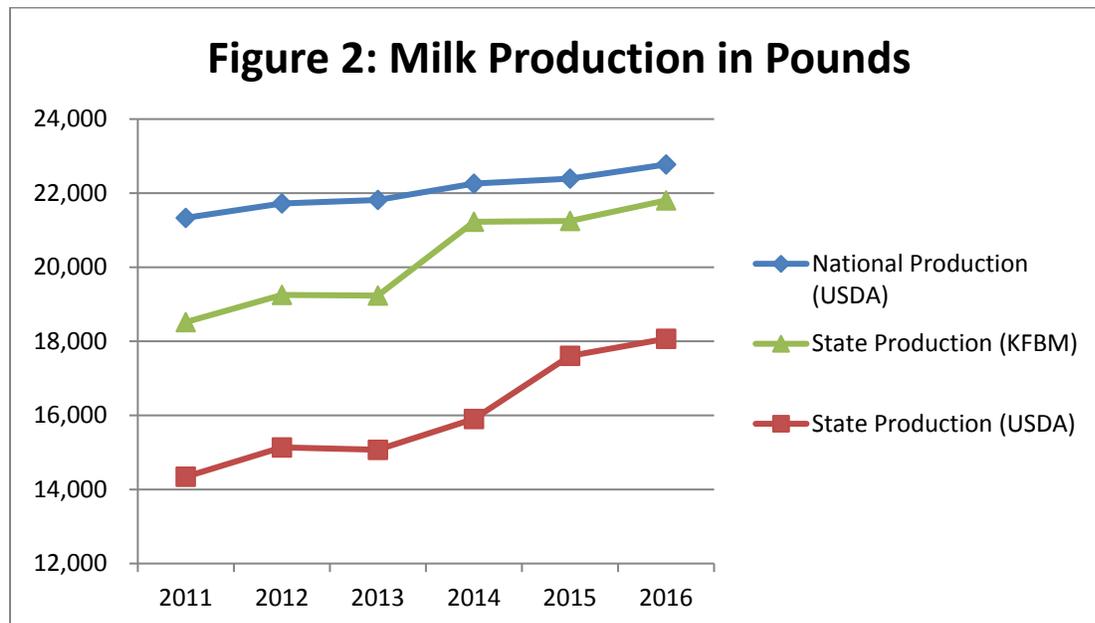
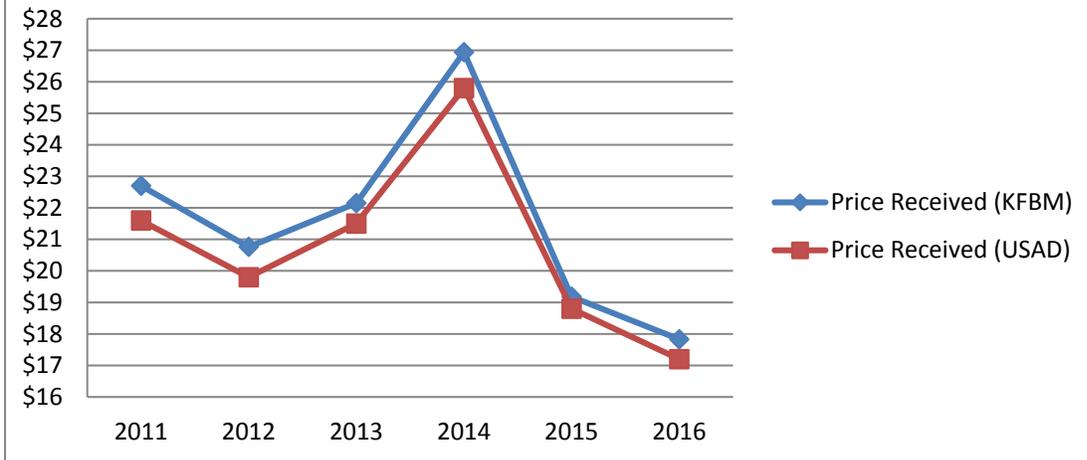


Figure 3: Price Received Per Cwt for Kentucky

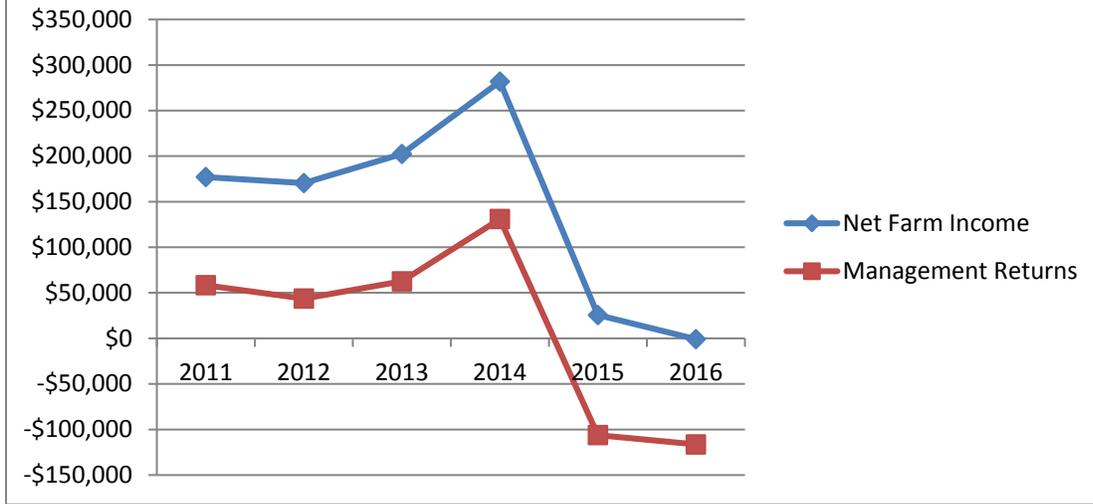


Farm Income and Management Returns

Once again, dairies in Kentucky faced another year of declining net farm income (NFI) and management returns. Net farm income takes into consideration depreciation and other adjustments and reflects comparative profitability. From 2013 to 2014, net farm income steadily increased and topped out at \$281,869. Profits on the average dairy in 2016 were at -\$878 NFI. That is a \$282,747 different in NFI between 2014 and 2016. Most of the decrease was between 2014 and 2015, with a decline of \$26,44 between 2015 and 2016.(Figure 4). Dairies in the program with fewer than 200 cows experienced a positive NFI of \$11,041. Larger dairies experienced a loss of \$-12,797. One of the factors that play into the difference between the groups is the amount of depreciation taken. Larger dairies took about \$39,568 or \$244 per cow less in depreciation than ones with less than 200 cows. However, larger dairies made \$398.77 less per cow in revenue with most of the lost coming from returns above feed cost.

Management returns is calculated by subtracting operator labor cost (paid and unpaid family labor) and equity capital charge from NFI. Just like NFI, the average management returns fell once again for the second straight year going from -\$106,156 in 2015 to -\$116,331 in 2016. For dairies with more than 200 cows average management returns was - \$175,630, while dairies with fewer than 200 cows was -\$57,032.

Figure 4: Net Farm Income



Conclusion

Dairies participating in Kentucky Farm Business management program endured another decline in profitability for a third straight year. Larger dairies in the average did not perform any better than small dairies on a per-cow basis in several key areas. The only successful point to mention about the year was dairies increased their milk production for another year. Once again, 2016 brought low milk prices, net farm returns, and management returns, which like year before are all signs of less than successful year in the industry. Looking forward to 2017, the situation still looks grim for dairies across the state.

Table 1: Kentucky Dairy Farms by Size

Summary of Kentucky Dairy Farms by Size - 2016			
Range in Size (Acres)	All	0-199 Cows	200+ Cows
Management Returns	All	All	All
Number of Farms	16	8	8
Total Acres in Farm	585	282	888
Tillable Acres in Farm	436	228	644
Operator Tillable Acres	436	228	644
Percent Land Owned	57.7%	62.9%	55.8%
Percent Land Crop Share	0.0%	0.0%	0.0%
Percent Land Cash Rent	42.3%	37.1%	44.2%
Months of Hired Labor	37.9	13.7	62.1
Months of Unpaid Labor	14.4	11.6	17.3
Total Months Labor	52.3	25.3	79.3
FARM RETURNS			
Total Cash Operating	1,048,823	500,658	1,596,989
Inventory Change	(27,015)	(8,636)	(45,393)
Accounts Receivable Change	275	1,000	(450)
Farm Products Used	0	0	0
Less Purchased Feed & Grain	306,911	131,446	482,376
Less Purchased Livestock	28,030	15,463	40,597
GROSS FARM RETURNS	687,143	346,114	1,028,173
FARM COSTS			
Total Cash Operating	607,070	279,144	934,996
Farm Products Used	0	0	0
Prepaid Expense Change	5,084	(452)	10,620
Accounts Payable Change	5,487	5,540	5,435
TOTAL OPERATING EXPENSE	617,640	284,231	951,050
INCOME BEFORE DEPRECIATION	69,503	61,883	77,123
Less Depreciation	71,416	51,632	91,200
FARM OPERATING INCOME	(1,913)	10,251	(14,077)
Capital Account Adjustment	1,035	790	1,280
NET FARM INCOME (NFI)	(878)	11,041	(12,797)
Less Unpaid Family Labor	2,733	5,466	0
RETURNS TO OPERATOR LABOR			
CAPITAL, & MANAGEMENT	(3,611)	5,576	(12,797)
Less Unpaid Operator Labor	39,353	28,421	50,284
RETURNS TO EQUITY CAPITAL			
& MANAGEMENT	(42,963)	(22,846)	(63,081)
Less Equity Capital Charge	73,368	34,186	112,549
MANAGEMENT RETURNS	(116,331)	(57,032)	(175,630)
FINANCIAL EFFICIENCY RATIOS			
Operating Expense Ratio (%)	85.37%	75.25%	88.77%
Depreciation Expense Ratio (%)	10.39%	14.92%	8.87%
Interest Expense Ratio (%)	4.52%	6.87%	3.73%

NFI from Operations Ratio (%)	-0.28%	2.96%	-1.37%
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Table 2: Dairy Herd Analysis

Dairy Cow Herds: Production, Returns, and Feed Cost -2016	KENTUCKY FARMS - PER COW		
	AVERAGE FARM	AVERAGE FARM	AVERAGE FARM
	All	0-199 Cows	200+ Cows
Range in Size (Cows)			
Number of Farms	16	8	8
Number of Cows in Herd	214	99	328
Pounds of Milk Produced	21,805	19,486	22,505
Pounds of Beef Produced	489	476	493
Milk Equivalents (M.E.)*	231	207	239
Value of Milk Sales	3,889	3,753	3,929
Value of Beef Sales	236	249	232
Patronage Returns	9	16	7
Total Returns	4,134	4,018	4,169
Value of Grain & Roughage Fed	999	992	1,002
Value of Supplement Fed	1,391	1,408	1,386
Total Value of Feed Fed	2,390	2,400	2,387
Returns above Feed Cost	1,744	1,618	1,781
Returns Above \$100 Feed Fed	173	167	175
Total Pounds of Feed Fed			
Grain	1,529	1,166	1,639
Supplement	1,057	444	1,242
Complete Feed	7,160	7,001	7,208
	Total Concentrates		
	9,746	8,611	10,088
Hay & Dry Roughage	4,202	6,228	3,591
Corn Silage	31,545	24,550	33,655
Other Silage	2,880	2,892	2,877
Pasture Days	172	158	176
Hay Equivalents (Tons)	9.8	9.4	9.9
Cost / Cwt of Supplement	20.33	28.70	19.42
Cost / Cwt of Concentrates	15.27	17.22	14.77
Pasture Days / Animal Unit	97	89	99
Cows Dry %	12.9%	11.7%	13.3%
Animal Units in Herd	381	176	586
Total Number of Calves Born	205	86	324
Calving Percent	95.8%	86.8%	98.5%
Butterfat Percent	3.71%	3.93%	3.65%
Pounds of Butterfat Per Cow	809	766	823
Protein Percent	2.22%	1.57%	0.36%
Pounds of Protein Per Cow	483	423	564
Price Received Per Cwt Milk	17.83	19.26	17.46
Price Received Per Cwt Beef Mkt	105.91	88.85	109.01
Pound Beef Sold Mkt	22,187	6,838	37,536
Purchase Price Per Animal - Breeding	1,776	1,566	1,878
% Cull Rate - Breeding	29.7%	32.6%	28.9%
Weight Per Breeding Animal Sold	1,142	1,138	1,144
Price Received per Cwt Beef-Breeding	72.37	72.59	72.29
Death Loss - Total Pounds	17,978	5,453	30,503
Death Loss - % Pounds Produced	17.2%	11.6%	18.8%
Market Number	20	5	35
Breeding Number	13	4	21
Breeding Survival Rate %	97.1%	97.9%	96.3%
Net Farm Income Per Cow	(4.11)	111.46	(38.97)
Management Returns Per Cow	(544.25)	(575.72)	(534.77)

