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Kentucky Farm Business Management Program

# Annual Summary Data: Dairy 2015



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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 2015 performance data, both financial and physical, on 363 Kentucky farm businesses. Some data are presented for previous years so that trends and changes can be studied. This is the 49th 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 2015, 665 farmers on 373 farms were members of the Kentucky Farm Business Management program keeping records under the direction of 9 Farm Business Management Specialists. The program serves farmers 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 2.85 percent on the current value of land and 4.95 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 4.95 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 \$2,900 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.

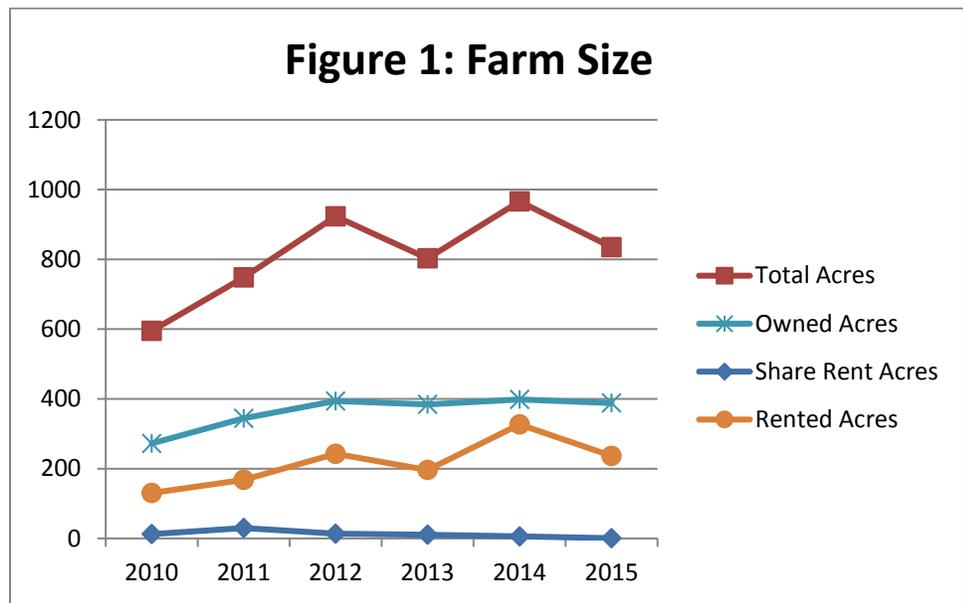
*Pasture Days* is the number of days the operator(s) reported that livestock derived a significant portion of nutrition from pasture. The charge to livestock for pasture days is the number of days multiplied times the number of animal units involved at a calculated cost of \$0.31/day for producing grass 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 in 2015 saw steady milk production while the number of cows declined along with the price of milk. Farmers also experienced increase in cost of production so returns and income decreased. This publication will go into further detail how Kentucky dairies performed in many areas such as: farm size, milk production, returns above feed cost, net farm income and management returns.

**Farm Size and Farm Numbers**

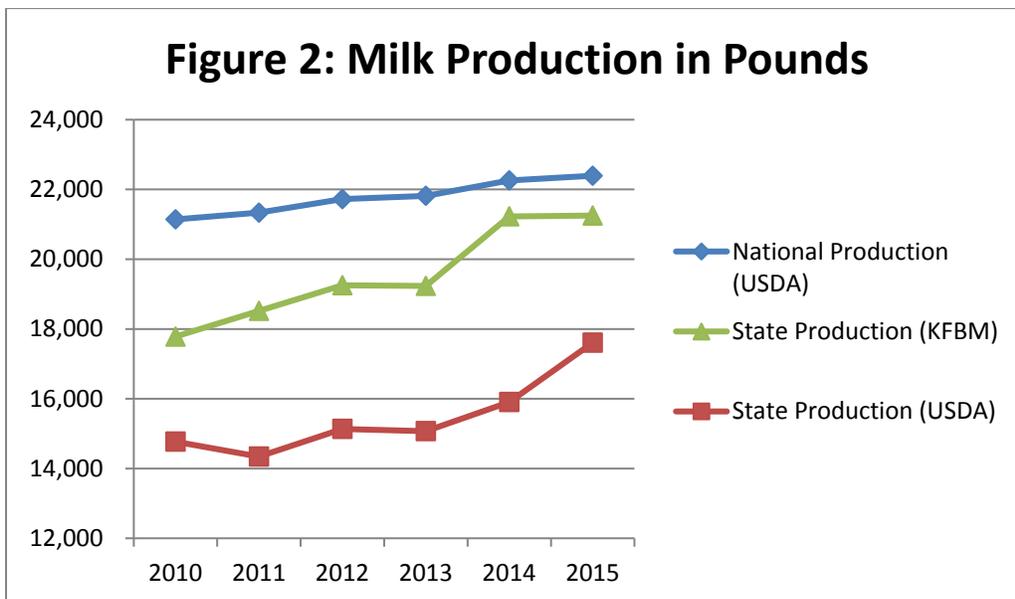
Kentucky Farm Business Management (KFBM) classifies a farm as a dairy when the value of feed fed is more than 40 percent of the crop returns and the dairy utilized more than one-third of the value of feed fed. Using this definition, in 2015 there were 19 dairies included in the data with 9 farms having more than 200 cows. One should mention that over the years, the number of farms and individual farms included in the data can vary. Just last year there were 25 dairy farms included in the 2014 Annual Dairy Summary. The reason for the decrease in dairy farms could vary across the state. Figure 1 shows how the raise and decline of dairy farm size over the last 6 years. In 2015, there was 388 owned acres, 237 rented acres, with only one acre of share rent.



## Milk Production

Once again KFBM dairies in 2015 had higher milk production per cow than USDA production for Kentucky. In recent years, Kentucky production has increased significantly, while farmers on KFBM has increased just slightly. Even though the average national milk production has only increase by 1,251 pounds in the past six years to 22,393, KFBM farmers have increased 3,468 pounds to 21,251 and the USDA state production increased by 2,838 to 17,607 pounds. For the past two years the average milk production in the KFBM has been pretty flat with only increased 22 pounds. This could be a result of less efficient dairies leaving the industry. (Figure 2)

KFBM saw fewer number of cows on average in 2015 compared to 2014, at 240 cows and 260 cows, respectively. There were 10 farms with fewer than 200 cows, with an average of 104 cows producing 18,543 pounds. For farms with more than 200 cows, on average produced 22,052 pounds of milk with 393 cows.



## Returns above Feed

Milk prices in 2015 were \$7.76/cwt cheaper at \$19.18/cwt for dairies in the KFBM data set. USDA reported milk price for Kentucky at \$18.80/cwt for 2015. In the past 6 years, KFBM dairies have on average reported higher milk prices than what the USDA releases. The down turn in the price started at the end of 2014 and continued through 2015. The steep decrease in price milk did not trigger government payments.

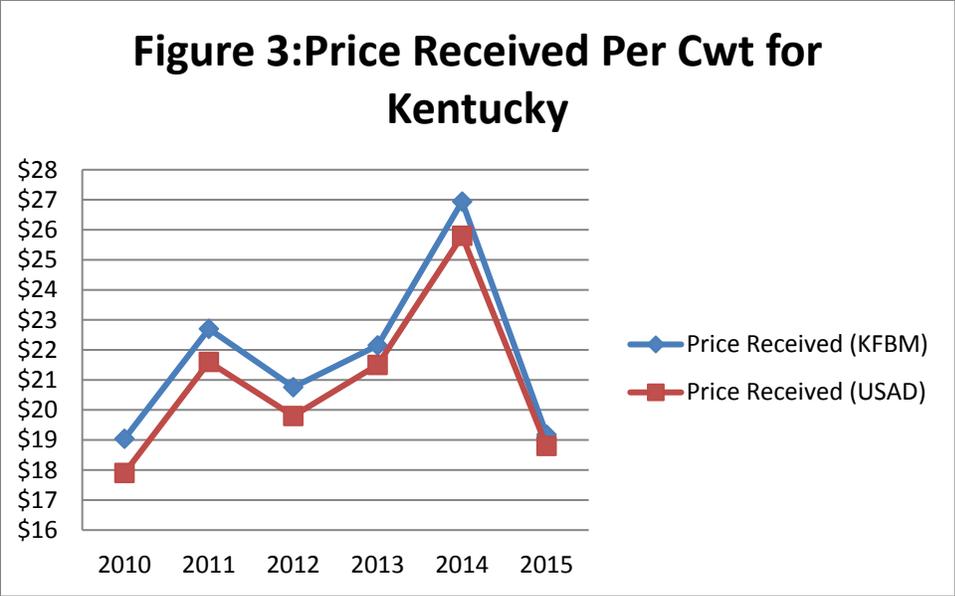
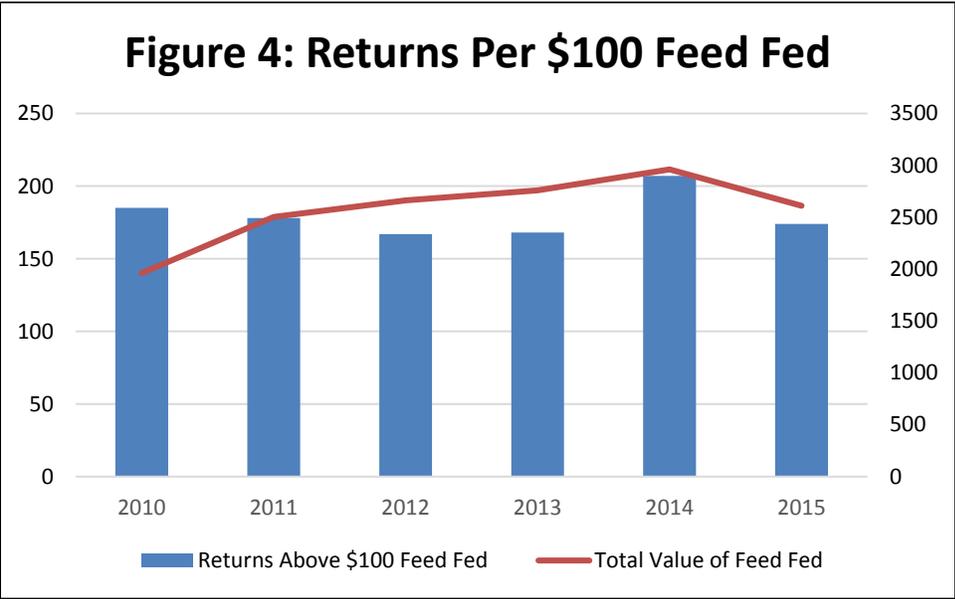
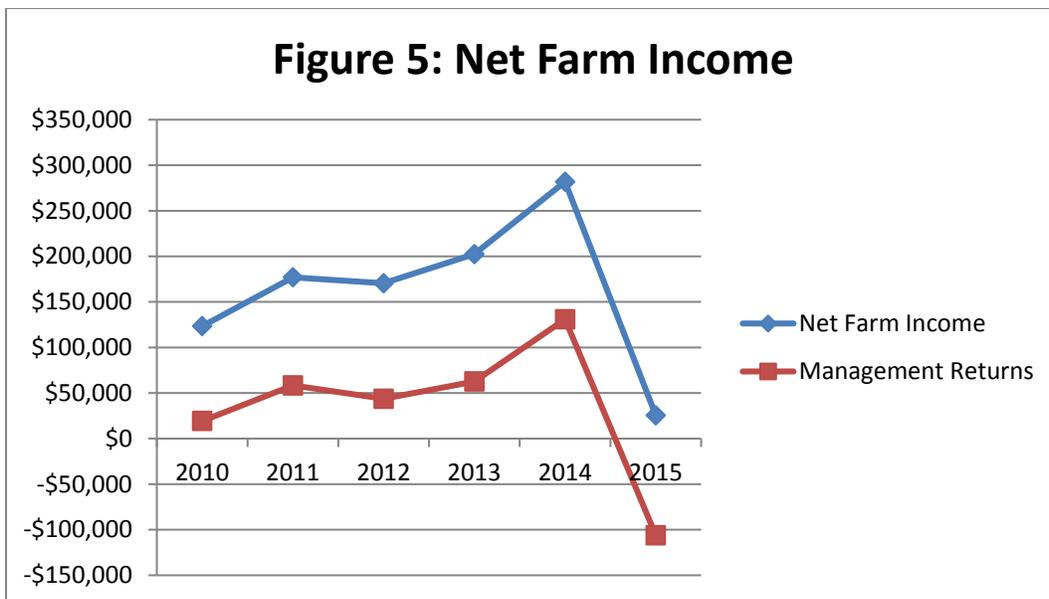


Figure 4 illustrates return per \$100 feed fed and total value of feed fed decreased for the first time since 2011. Reason for the decrease between 2014 and 2015 is illustrated in Table 2 with the value of milk sales dropped \$1621 per cow while feed cost dropped only \$395 per cow. Average return above \$100 feed fed was \$174 in 2015 and \$178 in 2011.



## **Net Farm Income and Management Returns**

2015 brought a significantly lower net farm income than the past 5 years. Net Farm Income (NFI) includes returns to the farm for unpaid family and operator labor, the interest on invested capital, and management. Net Farm Income also represents the amount the farm has generated for principal payments and family living for that particular year. On average the net farm income for the 19 participating dairies in the data was \$25,566 for 2015 (Table 4). That is a \$256,303 decline from 2014. Dairy farms with less than 200 cows, NFI was negative \$3,752 but dairies with more than 200 cows saw a positive NFI \$51,953. Going into 2015, farmers knew that times were going to be difficult with the decrease of milk prices, so most farmers tried to cut non-feed cost of production. The 19 farms in 2015 saw a reduction of \$207.60 per cow or a total of \$61,764. To calculate Management Returns subject operator labor cost (paid and unpaid) and equity capital. Management returns took a steep decline in 2015 compared to 2014, with the average being -\$106,156 and \$130,953, respectively. Both dairies under 200 and over 200 cows, saw negative management returns, at -\$57,497 and -\$149,949, respectively shown in Table 1.



## **Conclusion**

Dairies participating in Kentucky Farm Business Management program saw profitability take a huge decline in 2015. In the dairy industry there was not much to brag about in 2015 except with keeping up with high milk production per cow. The year brought low milk prices, net farm income, management returns, are all indications of a less than successful year. In looking forward to 2016, there has not be an overall increase in milk prices, so management are challenged to implement better practices to improve herd health, increase production per dollar feed fed, and cut cost.

**Table 1: Kentucky Dairy Farms by Size**

<b>Summary of Kentucky Dairy Farms by Size – 2015</b>			
Range in Size (Acres)	All	0-199 Cows	200+ Cows
Management Returns	All	All	All
Number of Farms	19	9	10
Total Acres in Farm	835	340	1,281
Tillable Acres in Farm	626	275	942
Operator Tillable Acres	626	275	942
Percent Land Owned	62.0%	59.5%	62.7%
Percent Land Crop Share	0.1%	0.0%	0.1%
Percent Land Cash Rent	37.9%	40.5%	37.2%
Months of Hired Labor	51.2	15.2	83.6
Months of Unpaid Labor	15.5	11.3	19.3
Total Months Labor	66.7	26.5	102.9
<b>FARM RETURNS</b>			
Total Cash Operating	1,323,111	569,174	2,001,653
Inventory Change	(16,854)	(47,705)	10,911
Accounts Receivable Change	934	1,571	360
Farm Products Used	0	0	0
Less Purchased Feed & Grain	363,631	154,177	552,141
Less Purchased Livestock	26,541	13,842	37,971
<b>GROSS FARM RETURNS</b>	<b>917,017</b>	<b>355,022</b>	<b>1,422,812</b>
<b>FARM COSTS</b>			
Total Cash Operating	760,215	301,236	1,173,296
Farm Products Used	0	0	0
Prepaid Expense Change	24,316	476	45,772
Accounts Payable Change	6,650	12,655	1,246
<b>TOTAL OPERATING EXPENSE</b>	<b>791,180</b>	<b>314,367</b>	<b>1,220,313</b>
INCOME BEFORE DEPRECIATION	125,837	40,655	202,500
Less Depreciation	99,475	43,467	149,882
<b>FARM OPERATING INCOME</b>	<b>26,362</b>	<b>(2,811)</b>	<b>52,618</b>
Capital Account Adjustment	(796)	(940)	(665)
<b>NET FARM INCOME (NFI)</b>	<b>25,566</b>	<b>(3,752)</b>	<b>51,953</b>
Less Unpaid Family Labor	1,832	3,867	0
<b>RETURNS TO OPERATOR LABOR</b>			
CAPITAL, & MANAGEMENT	23,735	(7,618)	51,953
Less Unpaid Operator Labor	43,195	29,000	55,970
<b>RETURNS TO EQUITY CAPITAL</b>			
& MANAGEMENT	(19,460)	(36,618)	(4,017)
Less Equity Capital Charge	86,696	20,879	145,932
<b>MANAGEMENT RETURNS</b>	<b>(106,156)</b>	<b>(57,497)</b>	<b>(149,949)</b>
<b>FINANCIAL EFFICIENCY RATIOS</b>			
Operating Expense Ratio (%)	81.69%	79.74%	82.12%
Depreciation Expense Ratio (%)	10.85%	12.24%	10.53%
Interest Expense Ratio (%)	4.59%	8.81%	3.65%
NFI from Operations Ratio (%)	2.87%	-0.79%	3.70%

**Table 2: Dairy Herd Analysis**

Dairy Cow Herds: Production, Returns, and Feed Costs – 2015	KENTUCKY FARMS - PER COW			ILLINOIS FARMS
	AVERAGE	AVERAGE	AVERAGE	AVERAGE
	FARM	FARM	FARM	FARM
Range in Size (Cows)	All	0-199 Cows	200+ Cows	All
Number of Farms	19	10	9	65
Number of Cows in Herd	240	104	392	147
Pounds of Milk Produced	21,251	18,543	22,052	23,310
Pounds of Beef Produced	553	461	580	661
Milk Equivalents (M.E.)*	236	199	248	258
Value of Milk Sales	4,076	3,787	4,162	4,140
Value of Beef Sales	456	277	509	453
Patronage Returns	10	3	11	9
<b>Total Returns</b>	<b>4,542</b>	<b>4,067</b>	<b>4,682</b>	<b>4,631</b>
Value of Grain & Roughage Fed	1,185	1,192	1,183	1,486
Value of Supplement Fed	1,426	1,488	1,408	978
<b>Total Value of Feed Fed</b>	<b>2,611</b>	<b>2,679</b>	<b>2,591</b>	<b>2,464</b>
Returns above Feed Cost	1,931	1,388	2,091	2,167
Returns Above \$100 Feed Fed	174	152	181	188
Total Pounds of Feed Fed				
Grain	1,998	3,248	1,629	5,348
Supplement	1,153	1,585	1,025	4,678
Complete Feed	<b>7,517</b>	<b>7,741</b>	<b>7,451</b>	<b>8</b>
Total Concentrates	10,668	12,573	10,105	10,034
Hay & Dry Roughage	5,607	6,076	5,468	3,333
Corn Silage	34,417	27,290	36,526	21,498
Other Silage	4,300	3,914	4,414	13,126
Pasture Days	154	73	177	7
Hay Equivalents (Tons)	11.0	9.0	11.6	8.1
Cost / Cwt of Supplement	16.46	21.17	14.31	20.88
Cost / Cwt of Concentrates	14.65	13.67	15.02	13.48
Pasture Days / Animal Unit	80	39	92	8
Cows Dry %	16.0%	20.6%	14.6%	11.9%
Animal Units in Herd	459	195	752	134
Total Number of Calves Born	221	89	367	65
Calving Percent	91.9%	85.6%	93.8%	43.8%
Butterfat Percent	3.58%	3.89%	3.50%	3.82%
Pounds of Butterfat Per Cow	761	722	773	891
Protein Percent	2.39%	1.19%	0.08%	2.16%
Pounds of Protein Per Cow	509	453	1,079	1,648
<b>Price Received Per Cwt Milk</b>	<b>19.18</b>	<b>20.42</b>	<b>18.87</b>	<b>17.76</b>
Price Received Per Cwt Beef Mkt	151.31	151.80	151.23	225.98
Pound Beef Sold Mkt	28,113	7,022	51,547	14,291
Purchase Price Per Animal - Breeding	2,082	1,683	2,288	1,908
% Cull Rate - Breeding	33.8%	45.4%	30.4%	31.8%
Weight Per Breeding Animal Sold	1,224	1,202	1,234	1,352
Price Received per Cwt Beef-Breeding	97.79	102.49	95.76	86.82
Death Loss - Total Pounds	22,819	9,782	37,306	13,178
Death Loss - % Pounds Produced	17.2%	20.4%	16.4%	13.5%
Market Number	26	12	42	12
Breeding Number	17	8	27	11
Breeding Survival Rate %	96.1%	96.2%	96.0%	96.0%
Net Farm Income Per Cow	106.35	(32.38)	147.40	
Management Returns Per Cow	(441.60)	(496.23)	(425.44)	

\* M.E. is value of beef produced divided by average price received per cwt. of milk sold plus cwt. of milk produced.