

## Kentucky Farm Business Management Program

### Annual Dairy Summary

2014



**September 2015**

By:

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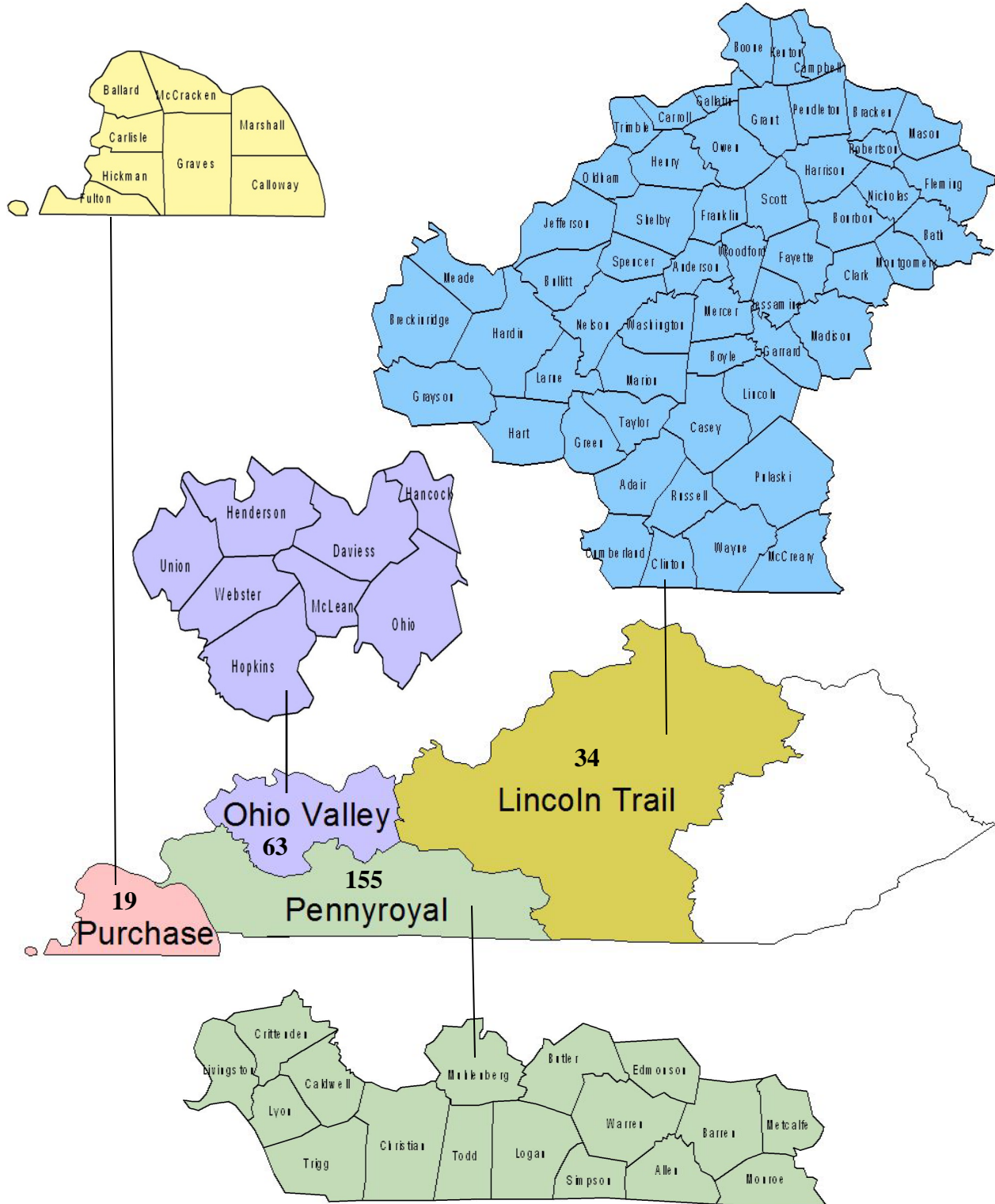
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# Map of Area, Counties, and Number of Area Cooperators, 2014



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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 2014 performance data, both financial and physical, on 271 Kentucky farm businesses. Some data are presented for previous years so that trends and changes can be studied. This is the 48th 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 2014, 649 farmers on 381 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**

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.

Note that any farm type may include farms with other enterprises, such as grain, livestock, and tobacco.

*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.

*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 2.95 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 \$2,725 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).

*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.



## **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 and is reported separately.

Note that ARC payments on the current year crop are not included in income as accounts receivable for the current year since payment is not calculated until the following year.

*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. Gross farm returns is 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 and the USDA Agriculture Marketing Service reports.

*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.

*Tillable Acres* can be used to produce a crop, including hay. Not all acres managed by the farm (Total Acres) are tillable acres, but may include farmstead and non-tillable acres.

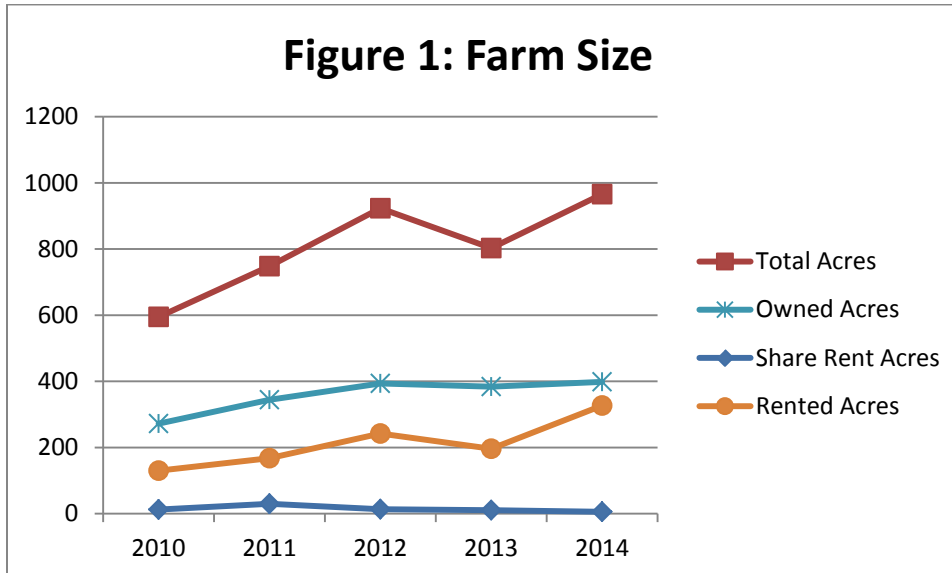
*Operator Acres* is owned and cash rented acres plus the operator's share of tillable acres under crop share leases.

*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 \$0.37/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.

## **Farm Size and Farm Numbers**

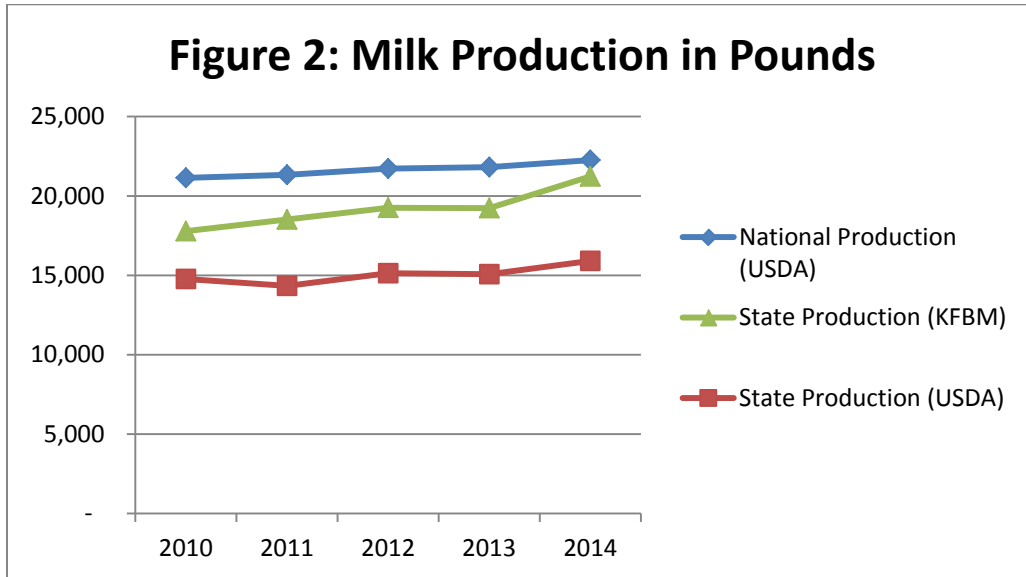
Kentucky Farm Business Management (KFBM) classifies a farm as a dairy when the value of feed fed is more than 40 percent of the crop returns and the dairy utilized more than one-third of the value of feed fed. Using this definition, in 2014 there were 25 dairies included in the data with 11 farms having more than 200 cows. One should mention that over the years, the number of farms included in the data can vary along with who is in the data set. Over the years the number of farms that are classified as dairies by KFBM has been decreasing. The reasons for the decline could vary across the state. Twenty-five farms are included in this year's data while 22 dairies in 2013, 29 dairies in 2012, 30 dairies in 2011 and 34 dairies in 2010. Overall, the number of acres of owned acres has been increasing slightly each year from 2011 until 2014, while share rented acres have been decreasing slightly over the same time period. In 2014, the numbers of owned and rented acres were very close: 399 acres and 327 acres respectively. The fluctuation in rented acres could result from adding 3 dairies from 2013 and dairy revenues.



## **Milk Production**

The number of cows in the average KFBM dairy herd increased by 8 cows from 2013 to 2014 to an average of 260 cows. The average number of cows for the fewer than 200 cows subset of the data was 108 cows with an average production of 19,906 pounds of milk per cow. The larger dairies with more than 200 cows averaged produced 21,632 pounds on milk from 452 cows. This increase could be a result of many factors including; the anticipated high price of milk going into 2014, new technology, better management practices put into place, herd management, etc. Overall milk production per cow was 2,149 pounds higher for the farms in the 2014 comparison. When compared to USDA production, KFBM dairies produce 5,324 more pounds

per cow than Kentucky dairies. National production for 2014 was only 1,029 more pounds than dairies participant in KFBM.

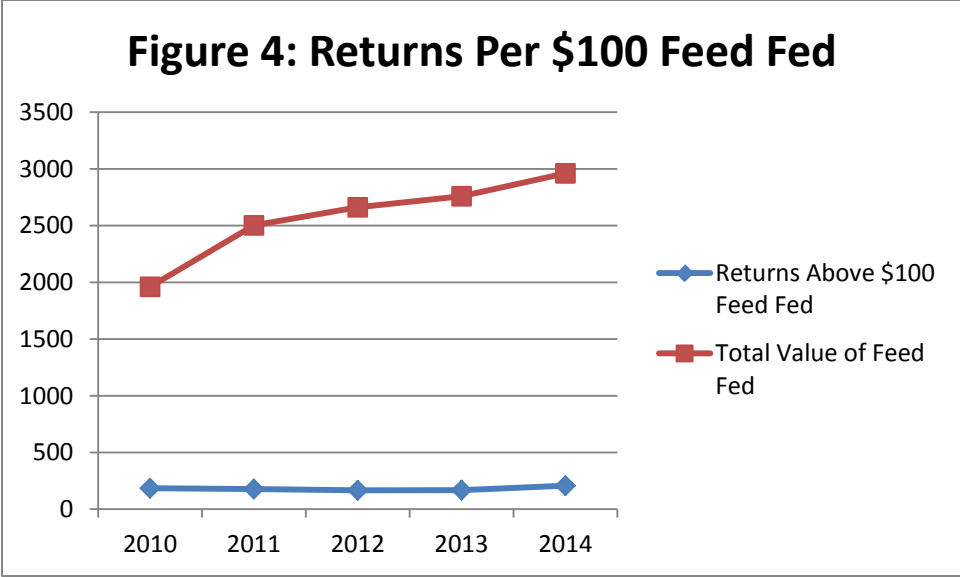
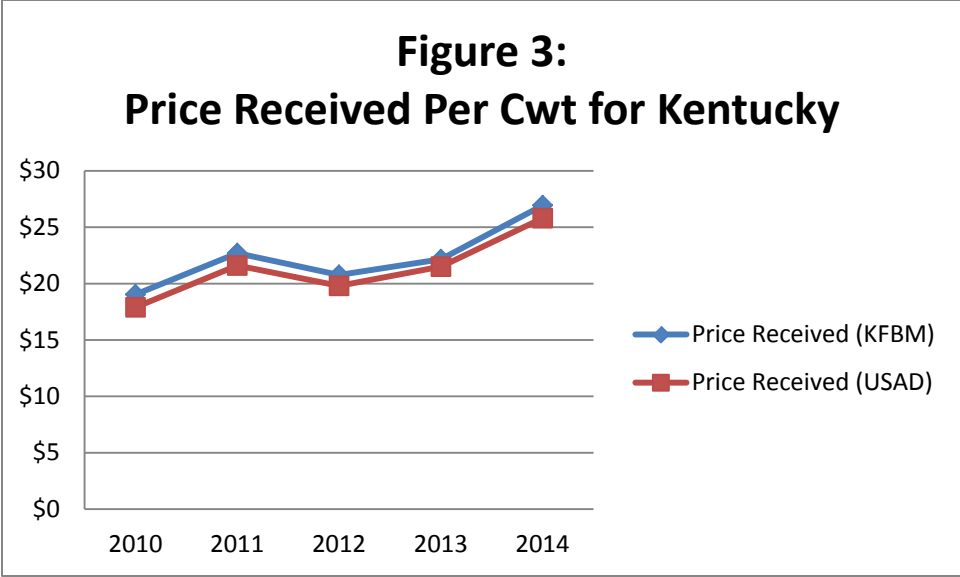


**Returns Above Feed Cost**

Figure 3 shows milk prices received by dairies participating in KFBM continued to rise in 2014, going from an average of \$22.15/cwt in 2013 to \$26.94/cwt in 2014. The dairies in the USDA Kentucky report received prices lower to what KFBM Kentucky dairies saw at \$25.80/cwt. High milk prices allowed some dairies to improve their financial situation. Table 3 Stop Light Analysis shows 2014 dairies included in the KFBM Comparative Analysis financial ratios for the group. Most of the ratios are in the “green” area meaning that there should be no concern or that the business is doing well. For example, return on asset (ROA) is 6.9% for the average KFBM dairy. ROA is a measure of profitability compared to the capital invested in the business. The higher the number the better the company/industry is at turning investments into profit. The ratios help demonstrate the overall financial health of Kentucky dairies in KFBM.

Even though Kentucky dairies saw high prices in 2014, when looking to 2015 prices are expected to decline. The decrease in price could be so dramatic that it could trigger government payments.

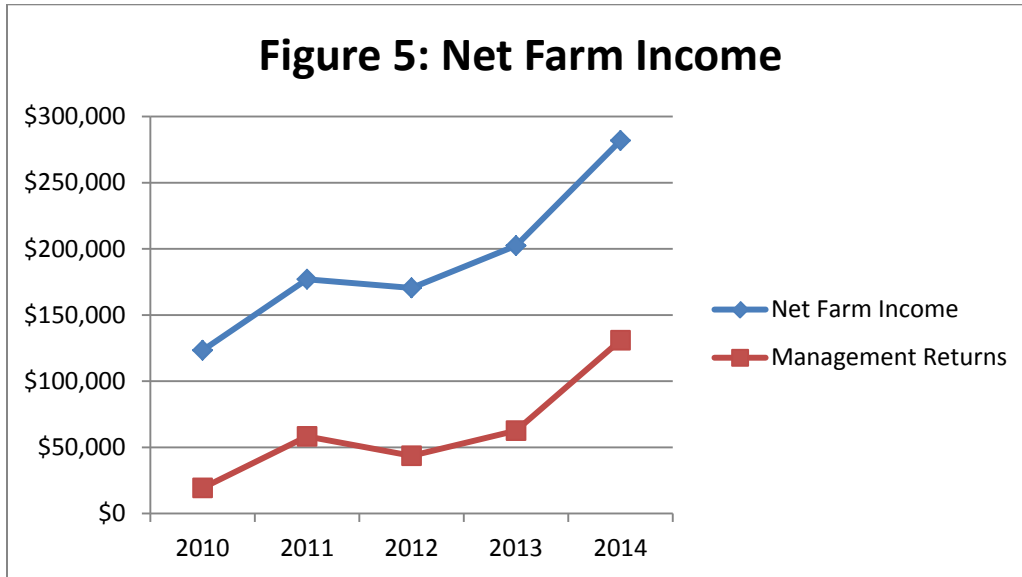
Figure 4 shows returns per \$100 feed fed in 2014 was higher than 2013: \$207 and \$168 respectively. Dairies with more the 200 cows averaged \$210 returns per \$100 feed fed. Both groups saw increases from 2013. The increase can be from multiple causes including feed cost being low throughout the year along with the increase in milk production and price.



**Management Returns and Net Farm Income**

Net Farm Income takes into consideration depreciation and other adjustments and reflects comparative profitability. For participating dairies average Net Farm Income (NFI) saw an increase of \$82,871 in 2013 to \$285,279 in 2014. The average NFI for dairies in KFBM has been increasing over time; however in 2015 dairies could see a decrease in NFI. Management returns is calculated by subtracting operator labor cost (paid and unpaid) and equity capital charge from NFI. The average management returns in 2014 was \$130,953. Management returns per cow more than doubled for the 2014 KFBM dairies compared to those participating in 2013. For dairies with fewer than 200 cows, management returns averaged \$32,035 with NFI of

\$114,092. For the other group with more than 200 cows management returns and NFI for 2014 were \$256,848 and \$503,153, respectively.



### **Conclusion**

For 2014 Dairy farmers participating in the Kentucky Farm Business Management program saw an increase in profitability. Milk prices started to increase at the end of 2013 and kept rising until late 2014. However, in 2015 dairies can expect a major decrease in milk prices. Overall, Kentucky dairies saw an increase in the number of cows, total production, NFI, management returns and milk prices, all of which indicated a profitable year.

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

<b>Summary of Kentucky Dairy Farms by Size - 2014</b>			
Range in Size (Acres)	All	0-199 Cows	200+ Cows
Management Returns	All	All	All
Number of Farms	25	14	11
Total Acres in Farm	966	460	1,610
Tillable Acres in Farm	732	374	1,189
Operator Tillable Acres	731	371	1,189
Percent Land Owned	54.5%	60.4%	52.1%
Percent Land Crop Share	0.8%	2.8%	0.0%
Percent Land Cash Rent	44.7%	36.7%	47.9%
Months of Hired Labor	54.9	21.4	97.5
Months of Unpaid Labor	18.5	14.6	23.5
Total Months Labor	73.5	36.1	121.0
<b>FARM RETURNS</b>			
Total Cash Operating	1,889,774	771,970	3,312,435
Inventory Change	35,672	11,733	66,140
Accounts Receivable Change	0	0	0
Farm Products Used	0	0	0
Less Purchased Feed & Grain	496,579	192,490	883,600
Less Purchased Livestock	63,444	36,886	97,245
<b>GROSS FARM RETURNS</b>	<b>1,365,424</b>	<b>554,327</b>	<b>2,397,730</b>
<b>FARM COSTS</b>			
Total Cash Operating	995,606	396,189	1,758,502
Farm Products Used	0	0	0
Prepaid Expense Change	(12,686)	(4,269)	(23,398)
Accounts Payable Change	(5,516)	(3,367)	(8,251)
<b>TOTAL OPERATING EXPENSE</b>	<b>977,405</b>	<b>388,553</b>	<b>1,726,853</b>
INCOME BEFORE DEPRECIATION	388,020	165,774	670,877
Less Depreciation	106,151	53,296	173,421
<b>FARM OPERATING INCOME</b>	<b>281,869</b>	<b>112,478</b>	<b>497,457</b>
Capital Account Adjustment	3,410	1,614	5,697
<b>NET FARM INCOME (NFI)</b>	<b>285,279</b>	<b>114,092</b>	<b>503,153</b>
Less Unpaid Family Labor	2,424	4,329	0
RETURNS TO OPERATOR LABOR			
CAPITAL, & MANAGEMENT	282,854	109,762	503,153
Less Unpaid Operator Labor	48,598	36,012	64,617
RETURNS TO EQUITY CAPITAL			
& MANAGEMENT	234,256	73,751	438,536
Less Equity Capital Charge	103,303	41,715	181,688
<b>MANAGEMENT RETURNS</b>	<b>130,953</b>	<b>32,035</b>	<b>256,848</b>
<b>FINANCIAL EFFICIENCY RATIOS</b>			
Operating Expense Ratio (%)	68.50%	65.18%	69.48%
Depreciation Expense Ratio (%)	7.77%	9.61%	7.23%
Interest Expense Ratio (%)	3.08%	4.91%	2.55%
NFI from Operations Ratio (%)	20.64%	20.29%	20.75%

**Table 2: Dairy Herd Analysis**

Dairy Cow Herds: Production, Returns, and Feed Costs - 2014	KENTUCKY FARMS - PER COW			ILLINOIS FARMS
	AVERAGE FARM	AVERAGE FARM	AVERAGE FARM	AVERAGE FARM
	All	0-199 Cows	200+ Cows	All
Range in Size (Cows)				
Number of Farms	25	14	11	65
Number of Cows in Herd	259	108	452	143
Pounds of Milk Produced	21,229	19,906	21,632	22,567
Pounds of Beef Produced	592	522	614	658
Milk Equivalents (M.E.)*	227	216	230	267
Value of Milk Sales	5,720	5,164	5,889	5,588
Value of Beef Sales	396	435	384	1,030
Patronage Returns	8	8	7	15
<b>Total Returns</b>	<b>6,124</b>	<b>5,607</b>	<b>6,281</b>	<b>6,660</b>
Value of Grain & Roughage Fed	1,292	1,313	1,285	1,709
Value of Supplement Fed	1,669	1,565	1,700	1,217
<b>Total Value of Feed Fed</b>	<b>2,961</b>	<b>2,878</b>	<b>2,986</b>	<b>2,927</b>
Returns above Feed Cost	3,163	2,729	3,295	3,734
Returns Above \$100 Feed Fed	207	195	210	228
Total Pounds of Feed Fed				
Grain	2,695	5,460	1,854	5,946
Supplement	1,419	1,074	1,524	5,012
Complete Feed	7,975	11,990	6,753	0
Total Concentrates	12,089	18,524	10,132	10,958
Hay & Dry Roughage	3,832	4,311	3,686	4,258
Corn Silage	35,476	31,683	36,630	20,318
Other Silage	4,913	4,672	4,986	12,369
Pasture Days	153	157	152	6
Hay Equivalents (Tons)	10.5	10.1	10.6	8.1
Cost / Cwt of Supplement	31.46	24.21	33.02	24.29
Cost / Cwt of Concentrates	15.20	9.98	18.11	15.34
Pasture Days / Animal Unit	81	81	81	5
Cows Dry %	12.7%	12.9%	12.7%	15.1%
Animal Units in Herd	489	209	846	188
Total Number of Calves Born	248	98	440	96
Calving Percent	95.7%	90.5%	97.3%	66.6%
Butterfat Percent	3.67%	3.78%	3.64%	3.88%
Pounds of Butterfat Per Cow	779	753	787	875
Protein Percent	3.56%	1.23%	0.25%	2.28%
Pounds of Protein Per Cow	756	553	886	1,594
<b>Price Received Per Cwt Milk</b>	<b>26.94</b>	<b>25.94</b>	<b>27.22</b>	<b>24.76</b>
Price Received Per Cwt Beef Mkt	122.33	122.91	122.12	167.96
Pound Beef Sold Mkt	37,442	17,247	63,145	16,551
Purchase Price Per Animal - Breeding	1,913	2,052	1,846	1,772
% Cull Rate - Breeding	31.5%	32.6%	31.2%	27.5%
Weight Per Breeding Animal Sold	1,216	1,194	1,223	1,350
Price Received per Cwt Beef-Breeding	91.20	95.76	89.78	91.52
Death Loss - Total Pounds	31,533	10,898	57,797	12,393
Death Loss - % Pounds Produced	20.5%	19.3%	20.8%	13.1%
Market Number	35	13	63	13
Breeding Number	20	8	37	12
Breeding Survival Rate %	95.9%	95.8%	95.9%	95.6%
Net Farm Income Per Cow	1,099.39	1,055.50	1,112.75	
Management Returns Per Cow	504.66	296.37	568.03	

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



**Table 3: KFBM Average Dairy Farm Financial Analysis**

<b>Farm Financial Analysis</b>		UK Farm Management Forms: FA	
Name	KFBM Average Dairy Farm	31-Dec-14	
↓	2.0      1.0	<b>Liquidity</b>	
		Current Ratio =	Total Current Assets / Total Current Liabilities
		2.2 =	\$552,801.32 / \$252,054.16
		Working Capital =	Total Current Assets - Total Current Liabilities
		\$300,747.16 =	\$552,801.32 - \$252,054.16
↓	30%      60%	<b>Solvency</b>	
		Debt/Asset Ratio =	Total Liabilities / Total Assets
		30% =	\$1,332,257.04 / \$4,492,821.44
↓	70%      40%		
		Equity/Asset Ratio =	Total Equity / Total Assets
		70% =	\$3,160,564.40 / \$4,492,821.44
↓	43%      150%		
		Debt/Equity Ratio =	Total Liabilities / Total Equity
		42% =	\$1,332,257.04 / \$3,160,564.40
		<b>Profitability</b>	
		Return on Assets =	Net Farm Income From Operations
			+ Farm Interest Expense
			- Value of Operator & Family Labor & Mgt
			/ Average Farm Assets [(Beg + End)/2]
↓	5%      1%	6.9% =	\$281,868.72
			+ \$42,101.72
			- \$51,022.60
			/ \$3,929,700.20
		Return on Equity =	Net Farm Income From Operations
			- Value of Operator & Family Labor & Mgt
			/ Average Farm Equity [(Beg + End)/2]
↓	10%      5%	9.0% =	\$281,868.72
			- \$51,022.60
			/ \$2,552,907.40
		<b>Financial Efficiency</b>	
		Asset Turnover Ratio =	Value of Farm Prod. / Average Farm Assets
		35% =	\$1,365,424.12 / \$3,929,700.20
		Operating Expense Ratio =	Total Op Exp - Depr / Value of Farm Prod.
		68% =	\$935,302.84 / \$1,365,424.12
		Depreciation Expense Ratio =	Depreciation Expense / Value of Farm Prod.
		8% =	\$106,150.84 / \$1,365,424.12
		Interest Expense Ratio =	Interest Expense / Value of Farm Prod.
		3% =	\$42,101.72 / \$1,365,424.12
		Net Farm Income from Operation Ratio =	NFIFO / Value of Farm Prod.
		21% =	\$281,868.72 / \$1,365,424.12

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