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Profitable Adjustments on Farms in Eastern Ozarks of Missouri

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SUMMARY AND CONCLUSIONS

In 1955, average family net income of all farm households in the Eastern Ozark area was \$2,042, of which only \$658 came from the farm. Gross farm income did not cover farm operating costs on 28 percent of the farms. If 5 percent interest is allowed on capital, no return to labor and management was earned on 53 percent of the farms.

Several reasons for the low farm income situation were apparent. One relates to the number and type of workers on farms in the area. Forty percent of the farms had fewer than one man-equivalent in the labor force. Many of the operators were limited as to the amount and kind of work they were able to perform because of age, poor health, or other handicaps. Another reason relates to the small size of many farm businesses. Also, many of the able-bodied farmers were engaged in part-time farming. Returns to approximately 42 percent of the part-time farmers did not cover the costs of operating their farm businesses. On most farms, low returns to the farm business were related directly to the choice of enterprises and levels of efficiency of management. Farm operators had diversified their operations to make use of all types of land and to maximize the use of their labor. As a result, they had spread management and use of labor and capital resources among many small enterprises. In many instances this limited financial returns.

Farmers in the Eastern Ozark area could increase net income by greater specialization in the most profitable enterprises. Assuming 1953-57 price relationships and improved production practices, an able-bodied, capable manager, with a medium-sized farm, could have expected net returns to land, labor, and capital from a unit of various enterprises as follows:

1. Beef cow-feeder calf (per cow)	\$ 7.77
2. Feeder calf, wintered and grazed (per calf)	\$ 24.35
3. Feeder calf, wintered (per calf)	\$ 10.55
4. Yearling, grazed (per yearling, summer only)	\$ 13.80
5. Sheep (per ewe)	\$ 10.73
6. Dairy cow (per cow):	
Grade A market, 4,000 pounds of milk per year	\$ 46.96
Grade A market, 8,000 pounds of milk per year	\$126.36
Grade C market, 4,000 pounds of milk per year	\$ -1.03
Grade C market, 8,000 pounds of milk per year	\$ 24.37
7. Feeder pigs (per sow and 14 pigs)	\$115.92
8. Fattening hogs (14 feeder pigs to sale weight)	\$ 87.22
9. Laying hens:	
100 hens	\$-16.00
250 hens	\$114.00
500 hens	\$942.00
1,000 hens	\$1,926.00
10. Broilers (20,000 birds per year)	\$793.00
11. Corn (per acre)	\$ 32.18

12. Corn silage (per acre)\$ 28.60
 13. Lespedeza and small grain, double-cropped (per acre)\$ 10.14

Under conditions on most farms, some diversification may be necessary for efficient use of all land or labor available. To evaluate various situations, farms were selected for study which were representative of those in each Economic Class of farms enumerated in a survey made in 1955. The present organization and practices, as well as nine different livestock organizations with improved practices, were budgeted for each typical farm. The net returns to owned land, labor, and capital at 1953-57 prices were as follows:

<u>Economic class of farm</u>	<u>Returns with 1955 organization and practices</u>	<u>Returns with best alternative organization and improved practices</u>	<u>Best alternative organization</u>
Class II	\$3,335	\$8,086	Feeder pigs and yearling steers grazed
Class III	3,414	9,306	Feeder pigs, hogs fattened and yearling steers grazed
Class IV	1,533	8,033	Feeder pigs and yearling steers grazed
Class V	754	7,667	Feeder pigs, hogs fattened and yearling steers grazed
Class VI	293	5,413	Feeder pigs, hogs fattened and yearling steers grazed
Part-time farm	-267	2,538	Feeder pigs, hogs fattened and yearling steers grazed
Residential farm	100	3,662	Feeder pigs and hogs fattened

To obtain these returns, operators of each class of farm would need to expand existing intensive enterprises, or adopt new ones, to combine with the extensive enterprises that make use primarily of the grazing resources of the area.

For each typical farm, net income would be increased most by shifting toward the intensive enterprises of producing feeder pigs and fattened hogs.

Producing eggs or broilers would be the second best opportunity. Producing Grade A milk would be next in line if cows that produce 8,000 pounds or more of milk were kept.

Because prices of cattle, hogs, milk, and poultry products vary differently from year to year, the relationships among prices change—sometimes even more than the prices of individual products. In 1959, for example, prices of hogs, milk, and corn were lower and prices of cattle higher than in 1953-57. Thus, at 1959 prices, the advantage of hog farming over other types would not have been as great as shown in the foregoing analysis. But even at 1959 prices—when hogs were at the bottom of a price cycle—the relative positions of the alternative types of farming would not differ, and each alternative type would be a better choice than the organization found on the typical farms in 1955.

High levels of income would not be possible with emphasis on extensive enterprises without enlarging operating units substantially. To provide a net return of \$2,000 per farm to the land, labor, and capital used in a beef cow and calf type of farming, the number of farms in the area would need to be reduced from 10,500 to 2,738 to allow for enlargement of beef cattle farms. Reductions of lesser magnitude would be needed if feeder yearlings, dairy cattle, or sheep were adopted as major enterprises.

The capital investment required to provide a net return of \$2,000 to land, labor, and capital would be considerable for some types of farming. If the land resources of various qualities were present in the same proportions as found on an average farm in the area, an investment of \$38,000 would be required for a beef cow and calf farm, \$31,000 for a feeder yearling farm, \$15,000 for a Grade A dairy farm, and \$20,000 for a sheep farm. By comparison, a net return of \$2,000 to land, labor, and capital would be obtained from an investment of \$4,000 in a feeder pig farm, \$11,000 in a poultry farm, and \$13,000 in a broiler operation. The major part of the feed needed on such farms would be obtained from the heavier grain-producing areas.

Profitable Adjustments on Farms in Eastern Ozarks of Missouri

RONALD BIRD AND FRANK MILLER*

INTRODUCTION

This is the second report on a study of 269 farm households in the eastern Ozark area of Missouri. The first report showed that 32 percent of the farm families had net household incomes of less than \$1,000 in 1955 (Table 1)¹. Twenty-five percent had net household incomes ranging from \$1,000 to \$1,999. Only about 43 percent received more than \$2,000 during the year.

TABLE 1-PERCENTAGE DISTRIBUTION OF FARM HOUSEHOLDS BY INCOME CLASS, EASTERN OZARKS OF MISSOURI

Income Class	Household Income ¹ (Percent)
0 - \$ 999	32.3
\$1,000 - \$1,999	25.3
\$2,000 - \$2,999	19.7
\$3,000 - \$3,999	10.8
\$4,000 and Over	11.9
Total	100.0

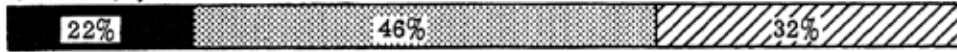
¹ Household incomes included all money received plus net farm income. Net farm income included all sales, the value of inventory changes and home consumed products, less expenses (including depreciation on farm machinery and buildings).

Source: Bird, Ronald; Miller, Frank; and Turner, Samuel C.; Resources and Levels of Income of Farm and Rural Nonfarm Households in the Eastern Ozarks of Missouri, Missouri Experiment Research Station Bulletin 661, 1958, p. 35.

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¹See Ronald Bird, Frank Miller, and Samuel C. Turner, Resources and Levels of Income of Farm and Rural Nonfarm Households in Eastern Ozarks of Missouri, Missouri Agricultural Experiment Station Research Bulletin 661, 1958.

FARM HOUSEHOLD INCOMES
Sample Households, Missouri Economic Area 8, 1955

ALL FARM HOUSEHOLDS**UNDER \$1,000****\$1,000 - 1,999****\$2,000 - 2,999****\$3,000 - 3,999****\$4,000 AND OVER**

Income: Farm Nonfarm Nonemployment

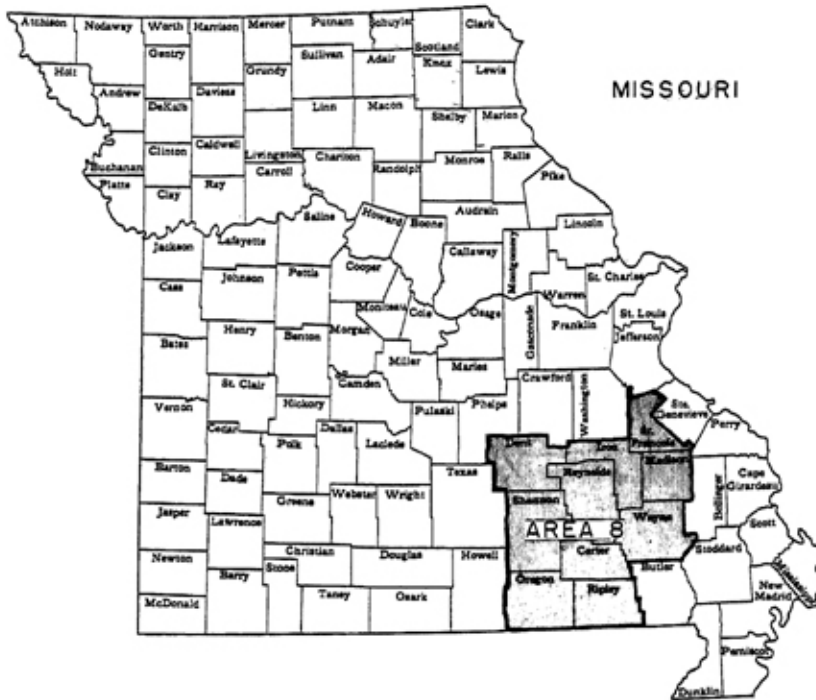
Source: Bird, Ronald; Miller, Frank; and Turner, Samuel C., Resources and Levels of Income of Farm and Rural Nonfarm Households in the Eastern Ozarks of Missouri, Missouri Agr. Expt. Sta. Res. Bul. 661, 1958, p. 36.

The average net household income of all farmers in the area was \$2,042, of which 32 percent came from the farm. About 22 percent of the average net household income of farmers who received less than \$1,000 came from the farm business (Figure 1). Farm households with net incomes of \$1,000 to \$1,999 obtained 45 percent of the total from the farm. In general, when household incomes increased above \$1,999, the percentage of the total that came from farming was less than 45 percent.

On 28 percent of the farms, gross farm income was not large enough to cover farm operating costs. If 5 percent interest were allowed on capital, only 47 percent of the farms would show any returns to labor and management.

CAUSES OF LOW INCOME

Many causes of the low incomes were indicated in the earlier report. Those most important in explaining the low level of income from farming are summarized as background for analysis of the opportunities for profitable adjustments.



Poor Land

The area studied is in the Eastern Ozark Plateau of Missouri (Figure 2). Several large streams and their tributaries have eroded the land deeply and made the surface exceedingly rough. Most upland soils are not well suited to production of cultivated crops. They are drouthy, low in nutrients, gravelly to stony in texture, and too steep for convenient use of farm machinery. The bottomland soils are inherently high in fertility and have good drainage, but the valleys are narrow and the fields of cropland are small and irregular. They are also subject to overflow from the streams.

Because of the rectangular type of ownership, most farms include only small acreages of cropland, even though the total acreage owned is large. For example, the average size of farm in the area in 1954 was 175 acres; the average acreage of crops harvested was only 25, of which about half was hay (Table 2).

The land unsuitable to crop production is used for pasture or timber. To utilize the large acreage of pasture land, grazing enterprises have been included in the organization of most farms. In 1954, livestock was the chief source of income, with cattle contributing about 60 percent and hogs 30 percent.² Sales of chickens and eggs accounted for the other 10 percent. Most of the grain concentrates needed to balance the livestock rations must be shipped in from other areas.

Small Farms

A farm that is large enough to employ fully all family labor is usually necessary for a successful farm business. In this area, about 88 percent of the farm businesses were not large enough to keep one man occupied for 300 days a year (Table 3). More than 96 percent of the farms on which the labor requirements

²United States Census of Agriculture, Volume I, Part 10, 1954, pp. 75-79.

TABLE 2-LAND USE IN MISSOURI ECONOMIC AREA 8, 1954.*

Item	Economic Class								Part-time	Residential
	Total	I	II	III	IV	V	VI			
Number of farms	10,560	9	95	443	789	1,620	1,430	2,366	3,808	
Land in farms (Acres)	1,851,676	29,815	71,699	199,860	267,832	420,805	242,041	335,506	284,118	
Cropland per farm (Acres)	56.9	553.3	182.1	152.8	113.9	87.8	57.9	44.5	23.7	
Cropland harvested per farm (Acres)	25.3	306.8	107.9	78.5	57.6	44.4	25.5	18.8	5.5	
Cropland pastured per farm (Acres)	27.1	170.7	72.1	70.9	53.7	39.9	28.1	21.5	12.8	
Cropland not harvested, not pastured per farm (Acres)	4.4	75.9	2.1	3.4	2.6	3.5	4.3	4.3	5.3	
Woodland pasture per farm (Acres)	55.8	1,448.6	244.7	163.7	128.9	82.1	48.4	43.4	19.5	
Other pasture per farm (Acres)	15.3	1,016.7	144.6	43.4	27.6	20.7	12.7	13.4	3.7	
Improved pasture per farm (Acres)	1.4	266.6	23.4	5.7	3.2	1.6	.5	.4	.1	
Woodland not pastured per farm (Acres)	42.3	264.3	167.7	80.9	59.5	62.8	44.8	35.8	24.9	
Other land in farms per farm (Acres)	5.1	29.8	15.5	10.4	9.5	6.4	5.4	4.7	2.8	
Per farm (Acres)	175.3	3,312.8	754.7	451.2	339.5	259.8	169.3	141.8	74.6	

*Source: U.S. Census of Agriculture, Vol. I, part 10, p. 193.

TABLE 3-MAN DAYS OF WORK REQUIRED TO TAKE CARE OF THE ENTERPRISES ON SAMPLE FARMS AND NET FARM INCOME PER FARM; BY SIZE OF BUSINESS, EASTERN OZARKS OF MISSOURI, 1955*

Man Work Days Per Year	Farms Operating At a Loss	Farms with Incomes of -										Farms in All Income Groups		
		0-\$499		\$500-\$999		\$1,000-\$1,999		\$2,000-\$2,999		\$3,000 and more		No.	%	
No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-99	50	64.1	41	57.0	14	30.4	3	7.1	1	5.6	---	---	109	40.5
100-199	24	30.8	21	29.2	25	54.3	21	50.0	4	22.2	1	7.7	96	35.7
200-299	2	2.5	5	6.9	4	8.7	12	28.6	6	33.3	3	23.1	32	11.9
300-399	1	1.3	5	6.9	2	4.4	4	9.5	5	27.8	3	23.1	20	7.4
400 and over	1	1.3	--	-----	1	2.2	2	4.8	2	11.1	6	46.1	12	4.5
Total	78	100.0	72	100.0	46	100.0	42	100.0	18	100.0	13	100.0	269	100.0

* A man work day is defined as the average amount of work that should be accomplished by a worker in a 10-hour day when working with average efficiency and average equipment on a medium-sized farm as defined by the Extension Service of the University of Missouri. The man work days needed to handle the enterprises were computed for each farm. Net farm income is defined as the net return to the farm family from owned capital, labor, and management. Rent paid for borrowed assets was excluded from this figure.

Source: Bird, Ronald; Frank Miller, and Samuel C. Turner, Resources and Levels of Income of Farm and Rural Nonfarm Households in the Eastern Ozarks of Missouri, Missouri Agricultural Experiment Station Research Bulletin 661, 1958, p. 44.

were less than 100 days a year returned incomes of less than \$1,000. In fact, 46 percent of the farms on which the labor requirement was less than 100 days a year were operated at a loss.

Many of the farmers on small farms have taken off-farm employment to supplement their farm incomes. Two in five of the male heads of households worked at nonfarm jobs in 1955. Of the operators who worked at nonfarm jobs, 42 percent received too little income from their farm enterprises to cover operating costs and depreciation on their farm equipment. With present enterprises, it seems that farming is not likely to be profitable unless the business is large enough to employ the operator full time. Thus, with current enterprises and practices the best choice may be either full-time farming or full-time off-farm employment.

Low Capacity of Operators for Work

More than four-fifths (84 percent) of the farm families in the area accomplished fewer than 200 standard work days of labor in 1955.³ The low labor accomplishment per household was closely related to the physical capabilities and age of the family head (Table 4). In 97 percent of the farm households, the

TABLE 4-PERCENTAGE OF FARM HOUSEHOLDS, BY NUMBER OF MAN WORK DAYS ACCOMPLISHED PER FARM HOUSEHOLD AND BY AGE OF MALE HEAD, EASTERN OZARKS OF MISSOURI, 1955

Age of Male Head	Man Work Days Accomplished Per Year			
	0-99 (Percent)	100-199 (Percent)	200 or more (Percent)	Total (Percent)
19 - 48 years	6.7	20.0	73.3	100
49 - 64 years	6.5	28.3	65.2	100
65 years and over*	36.1	37.5	26.4	100
Total	14.5	27.5	58.0	100

* Includes heads that may be under 65 years of age but were sick 60 days or more last year and also includes households with a female head.

head was the only male present who was between the ages of 20 and 64. Among the farm families that accomplished less than 200 days of work were about 27 percent in which the male head was 19 to 48 years of age. A partial explanation of this situation was the physical health of the male operator. Approximately 25 percent of the men who worked less than 200 days reported either a physical defect or a chronic illness that limited their physical activities. Most ailments listed were severe. They included heart trouble, lung disorders, blindness, and paralysis. In the 49 to 64 age bracket, about 45 percent of the operators had physical handicaps or chronic illnesses that limited their activities.

³A standard work day includes time spent on farm and nonfarm jobs. For each farm, it includes the amount of work that a worker should accomplish in 10 hours using average equipment and average efficiency on a medium-sized farm. For nonfarm work, a man work day was defined as a standard 8-hour day.

Age, also, was important in limiting the activity of the head of the family. In more than 25 percent of the households, the head was over 64 years of age in 1956. In 74 percent of these households, performance was about equally divided between less than 100 days and 100 to 199 days of work.

The level of education of the operators residing in the area was not high. More than 50 percent of the farm operators had eight or fewer years of formal training (Table 5). As the age of operators increased, the percentage of those with an eighth-grade education or less increased. Farmers who had the lowest incomes also had the fewest years of formal education. The advanced age and low educational level of many farmers residing in the area may be responsible for their lack of opportunities for off-farm employment.

TABLE 5-MALE HEADS OF SAMPLE FARM HOUSEHOLDS BY AGE AND EDUCATION GROUPS, EASTERN OZARKS OF MISSOURI, 1956.

Age of Male Head of Farm Household	Total in Age Group No.	Percentages of Age Group Who Had Attended School		
		0-8 years	9-12 years	13 years or more
		%	%	%
20-29 years	8	50.0	50.0	--
30-39 years	32	56.3	37.5	6.2
40-49 years	79	69.6	21.5	8.9
50-59 years	63	80.9	15.9	3.2
60-69 years	59	84.7	6.8	8.5
70 years and over	25	92.4	3.8	3.8
Total	266			

Results of the analysis led to the assumption that in about 60 percent of the farm households one man-equivalent of labor would be available in the future and in another 25 percent, only one-half of a man-equivalent would be available. In about 15 percent of the farm households it was estimated that the households should be rated as having no more than one-third of a man-equivalent of labor.

Absence of one full man-equivalent of labor in many households complicates the economic adjustment problem. Many of these households have incomes equal to those of their more able neighbors only because their earnings are supplemented with welfare payments. On these farms, a wise selection of enterprises suitable to the abilities of the labor resource is necessary, or the welfare payment may be dissipated in supporting the farm operation.

Small Capital Investment and Lack of Borrowing

Most of the farms in the area lack the resources to provide either full employment for a normal family labor force or satisfactory levels of income. In 1955, the total value of farm assets used by the average operator was \$13,745

(Table 6). This small capital investment provided employment for only one worker who, working with average efficiency, required only 148 days to perform the farm tasks. The average operator received a net return of \$658 from the land, labor, and capital used in this effort. On those farms from which sales of \$2,500 or more worth of farm products were reported in 1955 and with \$25,794 in farm assets, the labor requirement was enough to employ one worker 279 days and the net return to the operator's land, labor, and capital was \$1,869. The 1954 census indicated that less than 13 percent of the farmers in this area had gross sales of \$2,500.

Improvement in the net farm income on the farms that reported less than \$2,500 gross sales must come from increasing the size of the farm business. In some instances, this may be done by increasing the acreage, especially of cropland, and in others by expanding or intensifying enterprises on the existing acreage. In most instances, this would mean borrowing a considerable amount of money. Currently, farm families in this area borrow very little money. In 1955, short-term debt averaged only \$229 per family. Real estate mortgages averaged \$552, making a total debt of \$781 per family (Table 6). Indebtedness represented only 6.5 percent of the owner's equity. The relative amount of borrowing did not increase as farms increased in size.

One of the reasons why farmers do not use credit is the low return they now get on capital invested in the farm business. If in 1955, labor by members of the family had been charged at the prevailing farm wage rate in the area (\$5 a day), the return to owned capital on the average farm would have been a loss of \$82.

Diversified Farming

Another reason for the low returns to capital and the low farm incomes is the nature of the farming organizations. In an endeavor to maximize the use of their labor and to utilize all land resources, the operators have used many enterprises. The size of each enterprise has been so small that most of them have not received the care necessary to produce net returns to the capital invested and to labor. Even with good management, only a small income can be obtained from a small grazing enterprise. Operators of many of these farms would have been better off if they had devoted their labor and management skills to enterprises that would yield the highest return to labor and capital. In many instances, allowing some of their land resources to lie idle while they concentrated their capital and labor on those that gave them the greatest return would have been more profitable. No doubt productive efficiency would increase with greater specialization.

Interwoven with efficiency gained by increasing the size of farm business is the efficiency to be gained in farm marketing. For most farmers in the area, marketing costs for a few head of livestock or for small quantities of livestock products are excessive. Only through increasing the size of the enterprises and

TABLE 6-AVERAGE FINANCIAL CONDITION OF SAMPLE FARM HOUSEHOLDS, BY ECONOMIC CLASS OF FARMS,
EASTERN OZARKS OF MISSOURI, DECEMBER 31, 1955

Item	Economic Class of Farm								All Families	
	I-IV		V-VI		Part-time		Residential		269	
	56		92		66		55			
	\$	%	\$	%	\$	%	\$	%	\$	%
Assets										
Current										
Feed, seed, supplies	533	2.6	136	1.2	151	1.7	185	2.6	232	1.9
Livestock	3,315	16.2	1,840	15.5	1,126	12.6	815	11.4	1,762	14.7
Farm machinery	3,437	16.8	1,698	14.3	1,576	17.7	1,021	14.2	1,892	15.8
Household furnishings	890	4.3	496	4.2	400	4.5	279	3.9	510	4.3
Other assets	834	4.1	203	1.7	280	3.1	8	0.1	314	2.6
Fixed										
Land and buildings	11,469	56.0	7,489	63.1	5,395	60.4	4,861	67.8	7,266	60.7
Total assets	20,478	100.0	11,862	100.0	8,928	100.0	7,169	100.0	11,976	100.0
Liabilities										
Short-term debts	708	3.4	164	1.4	50	.6	64	.9	229	1.9
Real estate mortgage	792	3.9	512	4.3	511	5.7	427	5.9	552	4.6
Equity	18,978	92.7	11,186	94.3	8,367	93.7	6,678	93.2	11,195	93.5
Total liabilities	20,478	100.0	11,862	100.0	8,928	100.0	7,169	100.0	11,976	100.0
Assets owned	20,478	79.4	11,862	91.3	8,928	92.4	7,169	93.8	11,976	87.1
Land and buildings rented	5,316	20.6	1,130	8.7	733	7.6	471	6.2	1,769	12.9
Total assets operated	25,794	100.0	12,992	100.0	9,661	100.0	7,640	100.0	13,745	100.0

Source: Bird, Ronald; Miller, Frank, and Turner, Samuel C., Resources and Levels of Income of Farm and Rural Nonfarm Households in the Eastern Ozarks of Missouri, Missouri Agricultural Experiment Research Station Bulletin 661, 1958, p. 55.

combining the products with those of their neighbors can they reduce marketing costs to a reasonable level.

OBJECTIVE OF STUDY

Objective of this study was to explore alternative enterprises and methods of production that might give these farm people a desirable level of living. If the potential of their resources for various uses is determined, alternatives can be adopted by families in the area.

METHOD OF ANALYSIS AND ASSUMPTIONS

An analysis of the production alternatives for each farmer can be determined only through an analysis of alternative uses of his land, labor, and capital resources. A detailed analysis of this scope was not considered feasible. Instead, farms were grouped into classes having similar land, labor and capital resources, and a typical farm in each class was analyzed as a useful guide to other farm operators. The farm classification used in recent years by the U. S. Bureau of the Census, based largely on gross returns from sales of farm products,⁴ was used in this study. In 1954, the number of farms in Missouri Economic Area 8 in each of the 8 census classes was:⁵

<i>Commercial farms</i>	<i>Number of farms</i>
Class I	9
Class II	95
Class III	443
Class IV	789
Class V	1,620
Class VI	1,430
Total	4,386
<i>Noncommercial farms</i>	<i>Number of farms</i>
Part-time	2,366
Residential	3,808
Total	6,174

Detailed information on the characteristics of farm household members and the farm organization of a typical farm in each class was obtained from the sample survey of 269 farms that was conducted in 1956. The typical farm for each class was used for the budgeting analyses reported in this bulletin. A detailed

⁴Those farms that sold \$25,000 or more worth of farm products were placed in class I; \$10,000 to \$24,999 in class II; \$5,000 to \$9,999 in class III; \$2,500 to \$4,999 in class IV; \$1,200 to \$2,499 in class V; and \$250 to \$1,199 in class VI, provided the farm operator did not work off the farm more than 100 days or the income of the farm operator and members of his family was not greater than the income from farming; those farms selling \$250 to \$1,199 worth of products that did not fit class VI were classed as part-time units, and all farms with incomes of less than \$250 were classified as residential farms. U. S. Census of Agriculture, 1954, Vol. I, Part 10, p. XXII.

⁵U. S. Census of Agriculture, 1954, Vol. I, Part 10, p. 193.

analysis could not be made of Economic Class I farms as only one was included in the survey. The organization in 1955 and realized income at 1953-57 prices are shown for a typical farm in each of the other 7 classes. Alternative production plans that could be adopted and net incomes that could be expected from each farm were developed.

To determine potential farm production and net income on typical farms, each enterprise and each combination of enterprises were analyzed, using attainable efficiency levels and 1953-57 prices. Quantities of inputs of farm resources used in production and of outputs of products were those recommended by technicians at the University of Missouri or in the local area. It was assumed that cropland will continue to be scarce and that it will be used primarily to provide feed for livestock, which will continue to be the major source of farm income. The carrying capacity of the pasture will not be changed appreciably.

Prices

Prices for the years 1953 through 1957 were obtained from reports issued by the Agricultural Marketing Service, USDA, for the area or from local sources if published reports were not available (Table 7). The 5-year period, 1953-57,

TABLE 7-PRICES AT THE FARM IN EASTERN OZARKS OF MISSOURI, 1953-57

Item	Unit	Period	Price
Alfalfa hay	Ton	Oct., Nov., Dec.	\$ 26.41
Mixed hay	Ton	Oct., Nov., Dec.	\$ 19.98
Lespedeza hay	Ton	Oct., Nov., Dec.	21.03
Timothy hay	Ton	Oct., Nov., Dec.	23.03
Corn silage	Ton	Oct., Nov., Dec.	7.26
Corn	Bushel	Oct., Nov., Dec.	1.29
Cottonseed meal, 41% protein	Cwt.	Oct., Nov., Dec.	3.55
Oats	Bushel	Oct., Nov., Dec.	.79
Soybean meal, 41% protein	Cwt.	Oct., Nov., Dec.	3.88
Bran	Cwt.	Oct., Nov., Dec.	2.40
Soybean meal, 44% protein	Cwt.	Oct., Nov., Dec.	3.82
Beef cow, breeding stock	Head	Annual	150.00
Feeder steers	Cwt.	March-May	17.21
Feeder steers	Cwt.	Sept.-Dec.	16.30
Feeder calves	Cwt.	Sept.-Dec.	16.66
Fat steers, good grade	Cwt.	Sept.-Dec.	18.68
Sheep, breeding stock	Head	Annual	25.00
Fat lambs, choice grade	Cwt.	May-July	23.50
Wool, includes incentive payments	Pound	Annual	.62
Dairy cow, grade C	Head	Annual	150.00
Dairy cow, grade A	Head	Annual	240.00
Milk grade C, 4% B.F.	Cwt.	Annual*	2.85
Milk grade A, 4% B.F.	Cwt.	Annual*	4.22
Feeder pigs	Cwt.	Annual	26.94
Hogs	Cwt.	Annual	18.19
Eggs	Dozen	Annual	.33
Chickens, breeding stock	Pound	Annual	.10
Broilers guaranteed price of \$.06 a bird above chick and feed costs.			

* Transportation costs, deducted.

was used to reflect recent prices and price relationships in a period during which weather conditions in the area were about normal. Two of the 5 were dry years with rainfall of less than 10 inches during June, July, and August. But this was considered representative of the frequency of dry years during the last 40 years. Prices for feed and livestock were for the months in which products are usually sold or production items bought.

Crop Yields

In 1954, about half the cropland harvested was in hay crops and one-fourth was in corn. The remaining acreage was planted mainly to small grains, which were often complementary to the hay crop.⁶ The major hay crop was lespedeza. It was assumed, therefore, that corn, lespedeza hay, and small grains would be the major crops grown in the area.

Although many soils in the area are low in productivity, soil technicians at the University of Missouri believe that these deficiencies can be overcome with proper applications of fertilizer, and that yields of 60 bushels of corn, 35 bushels of small grain, and 1 ton of lespedeza hay per acre could be produced on most soils that had been previously planted to these crops. Some farmers in the area were achieving these levels.

Carrying Capacity of Grazing Land

Land unsuited to crop production was included in most farms in the area. Most of it was used for pasture. Input-output data on the various grades of grazing land was not available except from the experience and observations of County Agricultural Extension Agents and farmers in the area. In general, their views were as follows: (1) The length of the grazing season is about 180 days, and considerable variation is experienced because of the drouth condition of the soils and variable rainfall. (2) Most of the cropland pasture, such as native grasses that have been supplemented with seedings of lespedeza, timothy, and red top, will carry one animal unit equivalent on 3 to 5 acres. (3) Improved cropland pasture, such as orchard grass and ladino clover that has been adequately fertilized, will carry one cow and calf per acre. (4) The carrying capacity of the open permanent pasture (those lands from which brush has been removed and some seeding done) is one animal unit per 20 acres. (5) In making farm plans, wooded areas should not be included as available pasture land. These acreages are used as supplemental pasture, and their contributions are taken into account in the grazing capacity of the other pastures. The number of animal units that could be grazed on the average size farm in each economic class as computed with these estimates corresponded closely with the average number of grazing animal units per farm reported by the 1954 census (Table 8).

⁶U. S. Census of Agriculture, Vol. I, Part 10, 1954, pp. 193, 197.

TABLE 8-ACRES OF PASTURE AND CARRYING CAPACITY IN EASTERN OZARKS OF MISSOURI, 1954

Item	Economic Class							
	Commercial Farms					Other Farms		
	I	II	III	IV	V	VI	Part-time	Residential
Number of farms <u>1/</u>	9	95	443	789	1,620	1,430	2,366	3,808
	Acres							
Land in farm <u>1/</u>	3,312.8	754.7	451.1	339.5	259.8	169.3	141.3	74.6
Improved pasture	266.6	23.4	5.7	3.2	1.6	.5	.4	.1
Cropland pasture	170.7	72.1	70.9	53.7	39.9	28.1	21.5	12.8
Other pasture	1,016.7	144.6	43.4	27.6	20.7	12.7	13.4	3.7
	Animal Units Grazed							
Improved pasture <u>2/</u>	266.6	23.4	5.7	3.2	1.6	.5	.4	.1
Cropland pasture <u>3/</u>	42.7	18.0	17.7	13.4	10.0	7.0	5.4	3.2
Open permanent pasture <u>4/</u>	50.8	7.2	2.2	1.4	1.0	.6	.7	.2
Total	360	49	26	18	13	8	7	3
Total as computed from 1954 Census Data <u>5/</u>	151	39	25	18	14	9	7	2

1/ U.S. Census of Agriculture, Vol. I, part 10, p. 193. Acreage of farm computed by dividing total acreage by number of farms.

2/ Assumed one animal unit per acre as reported by County Agent and farmers.

3/ Assumed one animal unit per four acres as reported by County Agents and farmers.

4/ Assumed one animal unit per twenty acres as reported by County Agents and farmers.

5/ U.S. Census of Agriculture, Vol. I, part 10, 1954, p. 217.

Land Valuation

To allocate costs and expenses to an enterprise, value of the land used by that enterprise is needed as a basis for computing a land charge. Because of the rough topography in this area, a farm may include many classes of land, but the price will be for the farm as a unit. To derive a price for the various classes of land from the unit price of the farm, these assumptions are made:

1. *A farm is bought chiefly for the cropland it contains.*
2. *The value of the grazing lands can be derived by comparing their productivity capabilities with those of cropland.*
3. *The value of an acre of improved cropland pasture is equal to the value of an acre of harvested cropland.*
4. *The value of other grades of grazing land bears the same ratio to the value of improved cropland pastures as the ratio of their carrying capacities. Unimproved cropland pasture was assumed to be about a fourth as valuable as improved cropland pasture. Other open-pasture lands were assigned a value of one-twentieth that of improved cropland pasture.*
5. *No value for pasture was attributed to woodland pasture, other woodland, and other lands because those who rated land capabilities in the area believed that woodland had only limited cropping potential. Furthermore, an analysis of the income from these lands in 1955 showed that they contributed less than 3 percent of the gross farm income.*

An analysis of 1954 census data for the area indicated that each acre of harvested cropland or the acreage of grazing land capable of carrying one animal unit for the grazing season (including a proportional share of buildings) was worth \$152. This value was used in estimating the value of an acre of cropland and the acreage of grazing land needed to carry one grazing animal unit.

COSTS AND RETURNS FOR DIFFERENT ENTERPRISES

Costs and returns per unit of various kinds of livestock and crops were estimated to provide data for budgeting farm enterprises in the area. The quantities of farm resources used and of outputs of farm products per unit of each enterprise were those recommended by technicians at the University of Missouri or in the local areas. In analyzing the various livestock enterprises, the level of efficiency was assumed to correspond to what could be accomplished on a medium-sized farm of each type. The livestock enterprises selected were:

- Beef cow-feeder calf the calf sold at a weight of 450 pounds.
- Feeder calf or yearling a. calf purchased in fall, at a weight of 450 pounds, wintered, grazed, and sold in fall at 815 pounds.
- b. calf purchased in fall at a weight of 450 pounds and sold the following spring at a weight of 635 pounds.

	c. yearling purchased in spring at a weight of 635 pounds, grazed, and sold in fall at weight of 815 pounds.
Sheep enterprise	ewes wintered and grazed, lambs sold in spring at 80-pound weight.
Dairy enterprise	a. Grade C milk market, 4,000 pounds of milk per cow, 4 percent butterfat.
	b. Grade C milk market, 8,000 pounds of milk per cow, 4 percent butterfat.
	c. Grade A milk market, 4,000 pounds of milk per cow, 4 percent butterfat.
	d. Grade A milk market, 8,000 pounds of milk per cow, 4 percent butterfat.
Feeder pig enterprise	two litters sold per year.
Hog-fattening enterprise	two litters sold per year.
Laying-flock enterprise	100, 250, 500, and 1,000 hen housing capacity.
Broiler enterprise	broiler house of 5,000, 10,000, 15,000 and 20,000 bird housing capacity.

Beef Cow-Feeder Calf Enterprise

One of the most common livestock enterprises in the area is beef cows that produce feeder calves for sale in the fall. The cows utilize large quantities of low-quality roughage and pasture. Winter feeds commonly available are mixed and lespedeza hay, although some corn silage and alfalfa hay are grown and fed. In computing the potential returns from the enterprise, it was assumed that farmers have the alternative of selling the roughage produced or feeding it on the farm to livestock during the winter. But if they do not graze pasture with their own livestock, they realize no income from it, as little if any of the grazing land is rented. Hence, the grazing land is an integral part of a beef cow-calf enterprise. In estimating returns per unit for this enterprise, an acreage of pasture adequate to graze one animal unit for a grazing season was estimated.

Under 1953-57 price relationships, a beef cow-feeder calf enterprise on a medium-sized farm could return a net income to land, capital, and labor of \$7.77 per cow (Table 9). If the money needed to operate the enterprise was borrowed at the prevailing rate of interest (6 percent), the operator would have lost \$5.86 for each beef cow without allocating any returns to grazing land and labor. If interest had been paid on the average value of the acreage of grazing land in the area needed to carry a beef cow and calf, he would have lost \$13.46 per cow and would have provided his labor free. These results are based on a winter ration of corn silage and cottonseed meal. If the beef cows had been wintered on lespedeza hay, the results would have been worse. Instead of a loss of \$13.46 per cow, the operator would have sustained a loss of \$15.16 per cow and would have provided his labor free.

TABLE 9-POTENTIAL RETURNS AND COSTS FOR A 1,000 POUND BEEF COW IN EASTERN OZARKS OF MISSOURI ^{1/}

Item	Ration I	Ration II
Investment		
Land	\$152.00	\$152.00
Buildings	---	---
Equipment	10.00	10.00
Livestock	150.00	150.00
Operating costs	67.20	68.80
Returns		
Sale of 450 pound calf	74.97	74.97
Costs		
Feed		
Winter Ration I		
Corn silage (7,400 pounds) ^{2/}	26.86	
Cottonseed meal (185 pounds) ^{2/}	6.57	
Winter Ration II		
Lespedeza hay (3,330 pounds) ^{3/}		35.03
Pasture, lots, fences & equipment (180 days of grazing)		
Taxes and insurance	1.55	1.55
Repairs and depreciation	.78	.78
Fertilizer and other pasture costs	3.44	3.44
Livestock		
Breeding	5.00	5.00
Veterinary and drugs	3.00	3.00
Death loss	7.50	7.50
Taxes and insurance	1.00	1.00
Depreciation of cow	10.00	10.00
Miscellaneous	1.50	1.50
Total Costs	67.20	68.80
Net return to land, labor and capital	7.77	6.17
Interest on operating capital (6 percent)	13.63	13.73
Net return to land and labor	-5.86	-7.56
Interest on land (5 percent)	7.60	7.60
Net return to labor	-13.46	-15.16
	days	days
Productive man day equivalents ^{4/}	2.6	2.6

^{1/} Assumes 1953-57 price relationships, improved production practices and a specialized enterprise on a medium-sized farm.

^{2/} Winter ration (185 days) of 40 pounds of corn silage and 1 pound of cottonseed meal per day.

^{3/} Winter ration (185 days) of 18 pounds of lespedeza hay per day.

^{4/} The amount of time needed by a worker on a medium sized farm with average equipment and efficiency in Missouri. University of Missouri Agricultural Extension BF 5606, 1956, p. 8.

If the grazing period could be increased to 240 days without additional costs, the feed cost for a corn silage ration would be reduced by \$10.75 and for a lespedeza ration by \$11.36. But the longer grazing season would not enable operators to cover operating costs.

It was concluded from this analysis that under conditions assumed in the study, most farmers in the area could expect little return from grazing land and operating capital used in a beef cow-feeder calf enterprise. If the only alternative

were leaving the grazing land idle, the operator would be money ahead to do so. He would save on the average about \$6.00 per cow in interest on operating capital and the labor he used.

Feeder Calf or Yearling Enterprise

A feeder calf or yearling enterprise is defined as one in which calves are bought in the fall and either sold the following spring or fall or bought in the spring and sold in the fall. During this period, the major increase in the animal's weight is from growth. The nutritive requirements needed to maintain a satisfactory rate of growth have been indicated in many studies. The most common recommendation is a ration that produces about 1 pound of gain per day. To accomplish this objective in feeding young calves, a rather high-quality alfalfa, lespedeza, or timothy hay, or corn silage is recommended as suitable feed. Use of the latter two roughages would require the use of a supplemental protein feed. Also, the quality of the pasture would need to be superior to that on which beef cows are pastured. It was assumed, however, that this could be accomplished by a more careful rotation of pasture.

Recently, excellent results have been obtained from wintering feeder calves on corn silage with a protein supplement.⁷ As this type of feed is more uniform in quality in the area than any other roughage, the results on farms could correspond closely with results on experimental feeding. Lespedeza hay has been used for feeding calves in the area for many years. Therefore, these two rations were considered suitable for wintering feeder calves.

Wintering and grazing a yearling was assumed to require the same expense for housing that is needed for a beef cow. The winters are relatively mild and good windbreaks are abundant.

Using the inputs recommended and the 1953-57 price relationships, wintering and grazing feeder calves would bring greater returns per unit than those from a beef cow herd (Table 10). A return of \$9.64 per yearling was calculated for labor after rewarding land and investment in operating capital at prevailing rates of interest. This figure compares with a loss of \$13.46 per unit for the beef cow-calf enterprise.

Wintering calves produces a greater net return to labor in this area than grazing them the following summer. The major factor in favor of wintering calves is the difference in price in the spring, compared with the price in the fall (the 1953-57 prices were \$0.91 per hundredweight higher in spring than in fall). As a result, about two-thirds as much return to labor could be obtained by selling the yearling in the spring as by selling it in the fall (Tables 10 and 11). However, the returns per unit of labor spent in its care would be greater from wintering and grazing the animal.

Estimates of the returns from the grazing resources were based on two assumptions: First, it was assumed that a calf would gain a pound a day during the grazing season. Second, it was assumed that the charge per acre of grazing

⁷Dyer, A. J., Weaver, L. A. and Comfort, J. E., Winter Ration for Feeder Calves. Missouri Agricultural Experiment Station Bulletin 628, 1954, p. 9.

TABLE 10-POTENTIAL RETURNS AND COSTS FOR WINTERING AND GRAZING A FEEDER CALF IN EASTERN OZARKS OF MISSOURI ^{1/}

Item	Ration I	Ration II
Investment		
Land	\$152.00	\$152.00
Buildings	---	---
Equipment	10.00	10.00
Livestock	---	---
Operating costs	108.50	111.25
Returns		
Sale of 815 pound yearling	132.85	132.85
Costs		
Feed		
Winter ration I ^{2/}		
Corn silage (3,330 pounds)	12.09	
Cottonseed meal (185 pounds)	6.57	
Winter ration II ^{3/}		
Lespedeza hay (2,035 pounds)		21.41
Pasture, lots, fences, buildings and equipment (180 days grazing)		
Taxes and insurance	1.55	1.55
Repairs and depreciation	.78	.78
Fertilizer and other pasture costs	3.44	3.44
Livestock		
Purchase of 450 pound calf in fall	74.97	74.97
Death loss	2.66	2.66
Veterinary and drugs	2.00	2.00
Taxes on livestock	1.00	1.00
Salt and minerals	1.00	1.00
Miscellaneous	2.44	2.44
Total Costs	108.50	111.25
Net return to land, labor, and capital	24.35	21.60
Interest on operating capital (6 percent)	7.11	7.28
Net return to land and labor	17.24	14.32
Interest on land (5 percent)	7.60	7.60
Net return to labor	9.64	6.72
Productive man-day equivalents ^{4/}	1.02	1.02

^{1/} Assumes 1953-57 price relationships, improved production practices and a specialized enterprise on a medium-sized farm.

^{2/} Winter ration (185 days) of 18 pounds of corn silage and 1 pound of cottonseed meal per day.

^{3/} Winter ration (185 days) of 11 pounds of lespedeza hay per day.

^{4/} The amount of time needed by a worker on a medium sized farm with average equipment and efficiency in Missouri. University of Missouri BF 5606, 1956, p. 8.

TABLE 11-POTENTIAL RETURNS AND COSTS FOR WINTERING A 450 POUND CALF IN EASTERN OZARKS OF MISSOURI. 1/

Item	Ration I	Ration II
Investment		
Land	\$ 1.00	\$ 1.00
Buildings	---	---
Equipment	9.00	9.00
Livestock	---	---
Operating costs	98.73	101.48
Returns		
Sale of 635 pound yearling	109.28	109.28
Costs		
Feed		
Winter ration I <u>2/</u>		
Corn silage (3,330 pounds)	12.09	
Cottonseed meal (185 pounds)	6.57	
Winter ration II <u>3/</u>		
Lespedeza hay (2,035 pounds)		21.41
Livestock		
Purchase of 450 pound calf in fall	74.97	74.97
Death loss	1.35	1.35
Veterinary and drugs	1.01	1.01
Taxes on livestock	1.00	1.00
Salt and minerals	.50	.50
Miscellaneous	1.24	1.24
Total Costs	98.73	101.48
Net return to land, labor and capital	10.55	7.80
Interest on operating costs (3 percent) <u>4/</u>	2.96	3.04
Interest on equipment (6 percent)	.54	.54
Net return to land and labor	7.04	4.22
Interest on land (5 percent)	.05	.05
Net return to labor	7.00	4.17
Productive man day equivalents <u>5/</u>	. 9	. 9

1/ Assumes 1953-57 price relationships, improved production practices, and a specialized enterprise on a medium-sized farm.

2/ Winter ration (185 days) of 18 pounds of corn silage and 1 pound of cottonseed meal per day.

3/ Winter ration (185 days) of 11 pounds of lespedeza hay per day.

4/ Capital required for only six months.

5/ The amount of time needed by a worker on a medium sized farm with average equipment and efficiency in Missouri, University of Missouri B.F. 5606, 1956, p. 8.

land would not differ from the present pattern in accomplishing this task. To do this, a careful selection of the grass mixture and a rotation of pasture would be needed to insure adequate growth during hot, dry periods in summer. With land values at current levels, a minimum of 180 days of grazing is needed for a return to labor from the grazing operation (Table 12). It was estimated that \$2.39 per acre would have been returned to labor from a pasture that was able to carry one animal unit per acre for 180 pasture days (land rewarded at 5 percent per annum and operating capital rewarded at 6 percent per annum). Seeding for a supplemental fall pasture would not be practical unless it extended the grazing period materially. Instead, it might be better to produce hay or corn silage and to shift the livestock program to a wintering operation.

TABLE 12-POTENTIAL RETURNS AND COSTS FOR GRAZING A 635 POUND YEARLING IN EASTERN OZARKS OF MISSOURI ^{1/}

Item	180 Grazing Days
Investment	
Land	\$152.00
Buildings	---
Equipment	1.00
Livestock	---
Operating costs	119.05
Returns	
Sale of 815 pound yearling in fall	132.85
Costs	
Pasture, lots, fences, buildings, and equipment (180 days grazing)	
Taxes and insurance	1.55
Repairs and insurance	.78
Fertilizer and other pasture costs	3.44
Livestock	
Purchase of 635 pound yearling in spring	109.28
Death loss	1.31
Veterinary and drugs	.99
Taxes on livestock	---
Salt and minerals	.50
Miscellaneous	1.20
Total Costs	119.05
Net return to land, labor, and capital	13.80
Interest on livestock costs (3 percent) ^{2/}	3.40
Interest on pasture, etc. costs (6 percent)	.35
Interest on equipment (6 percent)	.06
Net return to land and labor	9.99
Interest on land (5 percent)	7.60
Net return to labor	2.39
Productive man-day equivalents ^{3/}	.12

^{1/} Assumes 1953-57 price relationships, improved production practices and a specialized enterprise on a medium sized farm.

^{2/} Capital required for only 6 months.

^{3/} The amount of time needed by a worker on a medium sized farm with average equipment and efficiency in Missouri. University of Missouri BF 5606, 1956, p.8.

Sheep Enterprise

Sheep are found on very few farms in the Ozark area. The reason may be related to past grazing practices of running sheep on range without adequate protection from predatory animals. Even now, the large number of hunting dogs in the area means that sheep must be placed in dog-tight enclosures at night. However, these conditions may not alter greatly the feasibility of sheep raising. As mentioned previously, open range and woodland have little value for pasture. Suitable grazing is found only in cleared areas, which are usually near the farmstead. The gain from closer supervision of the farm flock through placing it in an enclosure at night would more than offset the cost of building the enclosure and extra care. Thus, if these practices were adopted, a sheep enterprise would be practical on most farms.

TABLE 13-POTENTIAL RETURNS AND COSTS FOR A EWE, IN MISSOURI
ECONOMIC AREA 8 1/

Item	Ration I	Ration II
Investment		
Land 2/	\$ 30.40	\$ 30.40
Buildings	15.00	15.00
Equipment	3.00	3.00
Livestock	30.00	30.00
Operating costs	20.47	18.97
Returns		
Sale of 10 pounds of wool	6.20	6.20
Sale of 100 pounds of lamb 3/	23.50	23.50
Total	29.70	29.70
Costs		
Feed		
Winter Ration I 4/		
Corn silage (1,095 pounds)	3.97	
Lespedeza hay (341.5 pounds)	3.59	
Corn (32.0 pounds)	.69	
Bran (16.0 pounds)	.38	
Cottonseed meal (15.3 pounds)	.54	
Creep feed (120 days)		
Corn (54 pounds)	1.16	
Soybean meal (6 pounds)	.23	
Winter Ration II 5/		
Lespedeza hay (610.0 pounds)		6.42
Corn (31.6 pounds)		.68
Bran (15.8 pounds)		.38
Cottonseed meal (5.3 pounds)		.19
Creep feed (120 days)		
Corn (54 pounds)		1.16
Soybeans meal (6 pounds)		.23
Pasture, lots, fences, buildings, equipment (180 days grazing)		
Taxes and insurance	.31	.31
Repairs and depreciation	.16	.16
Fertilizer and other pasture costs	.69	.69
Additional fencing costs	.10	.10
Lambing shelter	1.00	1.00
Additional taxes and depreciation of equipment	.10	.10

TABLE 13-CONTINUED

Item	Ration I	Ration II
Livestock		
Breeding	.75	.75
Veterinary and drugs	1.20	1.20
Death loss	.60	.60
Taxes and insurance	.25	.25
Depreciation of ewe	3.50	3.50
Shearing	.50	.50
Miscellaneous	.75	.75
Total Cost	20.47	18.97
Net return to land, labor, and capital	9.23	10.73
Interest capital (6 percent)	4.11	4.02
Net return to land and labor	5.12	6.71
Interest land (5 percent)	1.52	1.52
Net return to labor	3.60	5.19
Productive man-day equivalents <u>6/</u>	.50	.50

1/ Assumes 1953-57 price relationships, improved production practices, and a medium-sized farm.

2/ Based on premise 5 ewes and lambs could graze on same acreage as 1 cow and calf.

3/ Assumed a 125 percent lamb crop and 80 pounds per lamb.

4/ a. Ewe fed 5.0 pounds corn silage, 1.5 pounds of lespedeza hay and 0.1 pound of cottonseed meal per day for first 100 days of 142 days prior to lambing.

b. Ewe fed 7.0 pounds of corn silage, 2.0 pounds of lespedeza hay; and 0.5 pounds of a mix of 6 parts corn, 3 parts bran, and 1 part cottonseed meal per day for 43 days.

c. Ewe fed 7.0 pounds of corn silage, 2.5 pounds of lespedeza hay and 0.75 pounds of a mix of 6 parts corn, 3 parts bran, and 1 part cottonseed meal per day for 43 days.

d. Lamb creep fed on .5 pounds of mix of 9 parts corn and 1 part soybean meal per day for 120 days.

5/ a. Ewe fed 2.7 pounds of lespedeza hay per day for first 100 days of 142 days prior to lambing.

b. Ewe fed 4.0 pounds of lespedeza hay and .5 pounds of mix of 6 parts corn, 3 parts bran and 1 part of cottonseed meal per day for 42 days prior to lambing.

c. Ewe fed 4.0 pounds of lespedeza hay and .75 pounds of mix of 6 parts corn, 3 parts bran, and 1 part cottonseed meal per day for 43 days after lambing.

d. Lamb creep fed same ration as in ration.

6/ The amount of time needed by a worker on a medium sized farm working with average equipment and efficiency in Missouri. University of Missouri Agricultural B.F. 5606, 1956, p. 8.

As with the other livestock enterprises, some of the costs were derived from the recommendations and observations of people acquainted with the area. Inputs other than feed were based on data obtained from the records of farmers participating in the Balanced Farming Program.⁸ Winter ration requirements were based on the recommendations of the Animal Husbandry Department of the University of Missouri. The ration used, with average management efficiency, should result in production of choice grade lambs.

⁸The Agricultural Extension Service has collected farm business records from about 240 farmers each year since 1955. This sample is considered to be representative of the full-time farmers in the State.

The average price of choice grade lambs in the Kansas City Market during the months of May to July was used in calculating returns because no suitable market outlet existed in the area. Transportation and marketing costs to this market outlet were deducted as an expense. It was assumed that the price of wool would be 62¢ a pound, which includes the incentive payments.

Based on these premises, the returns per day of labor would be about the same as from wintering and grazing feeder yearling cattle (Table 10 and 13). However, returns to labor and per acre of grazing land from the ewe-lamb enterprise would be almost twice as great as from feeder yearlings with 180 pasture days available (\$33.55 compared with \$17.24). Furthermore, a reduction in the quality of grazing because of drouth would not affect returns from the ewe-lamb enterprise as adversely as those from feeder yearlings. But the yearling enterprise would have the advantage of greater flexibility to utilize the rapid growth of pasture in the spring (yearlings purchased, grazed, and sold at the end of the grazing season).

Dairy Enterprise

Returns to a dairy enterprise are closely related to the type of market available. A market for Grade C milk is available in the area. The major market for Grade A milk is in St. Louis. To enter the St. Louis market, farmers would need to provide sufficient volume of full tank-truck loads. The hauling charge would be about 35¢ per 100 pounds of milk. After deducting this cost, the net price differential between the St. Louis market and the local market would be about \$1.37 per 100 pounds of milk.

To take advantage of the Grade A market, certain improvements in production facilities would be necessary. In estimating these costs per unit of operation, it was assumed that a dairyman would have 30 cows, which is considered the size of operation that one man can handle efficiently in the area.

A Missouri study completed in 1955 indicated that the highest net returns were obtained from cows producing from 6,000 to 10,000 pounds of milk per year in 1955 and 1956.⁹ Although this production level is considerably lower than that indicated by many DHIA records, it is considered representative of conditions in the area. This low production level is probably closely related to the inherent capabilities of the cows that were kept on the farms when the records were obtained. Whether the dairy cows in Economic Area 8 have any greater potential to convert feed into milk than those on the record-keeping farms is doubtful. For this reason, part of the input-output computations in this analysis were based on cows that would produce 8,000 pounds of milk per year.

The average milk production per cow in Missouri in 1946-55 amounted to 4,387 pounds. This production should be attained from a cow that is fed very little concentrate. Much of the milk from Missouri farms is produced under such feeding practice.

⁹Unpublished masters' thesis of Leonard, Eugene A. "Factors Influencing Income and Production Efficiency on Missouri Dairy Farms," 1955 and 1956, p. 47.

In considering the alternatives available to dairymen in this area, input-output data were assembled for four different production situations, as follows:

Grade A market

4,000 pounds of milk per cow

8,000 pounds of milk per cow

Grade C market

4,000 pounds of milk per cow

8,000 pounds of milk per cow

Balanced Farming records show that dairymen who produce at the higher levels spend about 60 percent more for their cows than those who produce at the lower levels. The differences in herd costs, as well as in feed requirements, were considered in estimating the costs associated with the two levels of production.

If 180 days of grazing were available and the input-output data were as estimated, the returns to land, labor, and capital invested in a dairy cow producing for a Grade C market would be a loss of \$1.03 if the cow were producing 4,000 pounds of milk and a profit of \$24.37 if the cow were producing 8,000 pounds of milk (Table 14). However, a dairyman producing for a Grade A market would receive \$46.96 return to land, labor, and capital for each cow producing 4,000 pounds of milk and \$126.36 for each cow producing 8,000 pounds of milk.

If operating capital were rewarded at the current rate of interest on its value, the operator producing for a Grade C milk market would sustain a loss under most producing conditions analyzed. However, producing for a Grade A market would have rewarded operating capital and land used in operating the business at current rates of interest and brought the operator a return to his labor of \$5.84 for each cow producing 4,000 pounds of milk and \$72.68 for each cow producing 8,000. A dairyman with a 30-cow herd and a Grade A market would receive \$0.58 for each 10 hours spent in taking care of the cows that produce 4,000 pounds of milk and \$7.27 for each 10 hours spent in taking care of the 8,000-pound producer.

Feeder Pig Enterprise

The previous analyses have dealt with enterprises that make extensive use of land. Enterprises on which capital and labor are applied to a relatively small acreage may be more practical on most farms in the area. Many farmers are moving in that direction. Feeder pig production, for example, has expanded rapidly in the Ozark area during the last ten years. Total sales rose from an insignificant number in 1948 to about 400,000 head in 1957. Marketing facilities have been built to serve almost every county through the cooperative efforts of local people and the Agricultural Extension Service. Spring and fall auction sales attract buyers from many states. More than half of the hogs marketed in the United States are finished for slaughter within a 400-mile radius of this area. If the rais-

TABLE 14-POTENTIAL RETURNS AND COSTS FOR A DAIRY COW IN EASTERN OZARKS OF MISSOURI 1/

Item	Grade A Market for Milk		Grade C Market for Milk	
	4,000 pounds of milk per cow	8,000 pounds of milk per cow	4,000 pounds of milk per cow	8,000 pounds of milk per cow
Capital requirement:				
Land 2/	\$153.00	\$153.00	\$153.00	\$153.00
Buildings 3/	236.00	236.00	103.00	103.00
Equipment 3/	50.00	50.00	30.00	30.00
Livestock 3/	150.00	270.00	150.00	270.00
Working Capital	121.84	211.24	115.03	203.63
Returns:				
Sale of milk	168.80	337.60	114.00	228.00
Costs:				
Feed:				
Roughage (3,885 pounds of lespedeza hay)4/	40.87	40.87	40.87	40.87
Grain Mix (740 pounds)	18.20		18.20	
Grain Mix (3,630 pounds)		89.30		89.30
Pasture, lots, fences, buildings, equipment (180 days of grazing):				
Taxes and insurance	1.55	1.55	1.55	1.55
Repair and depreciation	.78	.78	.78	.78
Fertilizer and other pasture costs	3.44	3.44	3.44	3.44
Taxes and insurance on additional equipment	.75	.75	.54	.54
Depreciation and repairs on additional equipment	4.50	4.50	2.70	2.70
Depreciation on buildings	7.00	7.00	3.00	3.00
Livestock:				
Breeding fees	8.00	8.00	8.00	8.00
Veterinary and drugs	12.00	12.00	12.00	12.00
Taxes and insurance	2.25	4.05	2.25	4.05
Depreciation of dairy cow	20.00	34.00	20.00	34.00
Miscellaneous	2.50	5.00	1.70	3.40
Total Costs	121.84	211.24	115.03	203.63
Net return to land, labor, and capital	46.96	126.36	-1.03	24.37
Interest on operating capital (6 percent)	33.47	46.03	23.88	36.40

TABLE 14-CONTINUED

Item	Grade A Market for Milk		Grade C Market for Milk	
	4,000 pounds of milk per cow	8,000 pounds of milk per cow	4,000 pounds of milk per cow	8,000 pounds of milk per cow
Net return to labor and land	13.49	80.33	-24.91	-12.03
Interest on land (5 percent)	7.65	7.65	7.65	7.65
Net return to labor	5.84	72.68	-32.56	-19.68
Productive man day equivalents ^{5/}	10.0	10.0	10.0	10.0

^{1/} Assumes 1953-57 price relationships, improved production practices, and a specialized enterprise on a medium sized farm.

^{2/} Includes \$152 investment for grazing land and \$1 for land on which buildings are located.

^{3/} Based on an analysis of Balanced Farming records for a 30 cow dairy herd.

^{4/} Roughage feed consists of 21 pounds of lespedeza hay per day or 42 pounds of corn silage and 1 pound of cottonseed meal per day-cost for either of the two rations were about the same, so costs for lespedeza hay were shown. Ration recommended in Feeding Your Dairy Herd, University of Missouri, College of Agriculture Folder 50, February 1956.

^{5/} The amount of time needed by a worker on a medium sized dairy farm (30 cows) with average equipment and efficiency in Missouri, University of Missouri Agricultural Extension BF 5606, 1956, p. 8.

ing of hogs should continue to expand as a separate enterprise, most of the feeder pigs could be farrowed in this area.

Improvement in quality has been an important factor in the development of the feeder pig business. Several years ago, it was a standard remark that an Ozark pig was ready for market if the hind quarters tipped down when he was picked up by his ears. Of the farmers who consigned their pigs to the 1957-58 fall and spring sales in one of the counties, 63 percent, had purebred herds. These farmers are quality conscious and strive always to provide buyers with better animals. Eighty-six percent of the farmers were feeding their hogs commercial supplement.¹⁰ This emphasis on quality has created a growing market for a product that did not exist a few years ago.

There are several reasons for this rapid expansion. The climate is suitable for the feeder pig enterprise; elaborate housing facilities are not needed. Satisfactory fences and shelters can be built with local materials at low cost. The growing practice of relatively uniform pricing of commercial supplements and mixed feeds has tended to equalize feed costs throughout the Midwest. Improved roads and special truck bodies facilitate the movement of pigs to the major hog-finishing areas. Extension of credit by feed dealers has enabled farmers to enlarge their breeding herds. More than 40 percent of the commercial farmers interviewed in Ripley County stated that they did not pay for their feed until their pigs were sold.¹¹

Analysis of sales data in the area for 1953-57 showed that the average sale weight of feeder pigs was 62.2 pounds. The average price was \$26.94 per 100 pounds. At these prices and the cost and production rates assumed in Table 15, farmers would have obtained an annual return to land, labor, and capital of \$115.92 per sow that produced 14 pigs in two litters a year. Sales of seven pigs per litter may seem high, but it has been reached by many producers in the area.¹²

If operating capital had been rewarded at current interest rates, each sow would have returned \$106.31 to land and labor. The investment in land needed for feeder pig production would be small. Relatively large acreages of unproductive, gravelly, well-drained soils that make ideal sites for feeder pigs are found on most farms. On the basis of the projected prices and production practices, a farm operator with 20 sows in his herd would receive about \$2.42 per hour for his labor. Returns to the feeder pig enterprise at 1953-57 prices exceed those to any other type of livestock.

A rather large number of feeder pigs is needed to provide full employment for a farm worker. If feeder pigs were the only livestock enterprise, an operator could care for about 75 sows. County agents who are familiar with the area in-

¹⁰Data obtained from an unpublished report on feeder cattle and pigs in Ripley County in 1958 by Crawford Price, County Agent.

¹¹*Ibid.*

¹²An analysis of the farm records of a sample of 50 commercial farmers indicated that they farrowed an average of 10 pigs per sow and marketed an average of 7 pigs per litter in 1958. Unpublished report by Crawford Price, County Agent in Ripley County.

TABLE 15-POTENTIAL RETURNS AND COSTS PER SOW IN FEEDER PIG ENTERPRISE IN EASTERN OZARKS OF MISSOURI ^{1/}

Item	
Capital requirement	
Land ^{2/}	\$ 1.00
Building and equipment	50.00
Livestock	50.00
Working capital	120.18
Returns	
Sale of 14 pigs (two litters) at 62.6 pounds per pig (876.4 pounds)	236.10
Costs	
Feed	
Sow, prior to farrowing (1,139 pounds grain mix) ^{3/}	26.20
127 pounds protein supplement	4.51
Sow, farrowing to weaning (1,120 pounds of corn) ^{3/}	24.08
168 pounds protein supplement	5.96
Creep feed-168 pounds of grain mix-(12 pounds per pig) ^{4/}	4.44
Feeder pigs, weaning to sale (1,113 pounds grain mix) ^{4/}	29.05
Livestock	
Breeding fee and replacement of sow ^{5/}	4.00
Veterinary and drugs	10.00
Insurance and taxes on livestock and equipment	2.00
Depreciation on buildings and equipment	5.00
Fencing and building repairs	1.40
Miscellaneous	3.54
Total costs	120.18
Net return to land, labor, and capital	115.92
Interest on livestock, buildings and equipment (6 percent)	6.00
Interest on working capital (3 percent) ^{6/}	3.61
Net return to land and labor	106.31
Interest on land (5 percent)	.05
Net return to labor	106.26
Productive man day equivalents ^{7/}	4.4

^{1/} Assumes 1953-57 price relationships, improved production practices and a specialized enterprise on a medium-sized farm.

^{2/} Land suitable for feeder pig enterprise was considered unsuitable for grazing or crops. Land of this quality can be obtained for \$8.00 per acre.

^{3/} University of Missouri Agricultural Experiment Research Station Balanced Farming Handbook 5604, 1956, p. 52.

^{4/} Seventeenth Annual Livestock Feeders Day, University of Missouri Agricultural Experiment Research Station Bulletin 652, April, 1955, p. 4.

^{5/} No value was assigned to loss from replacement of sow because value of marketable sow was considered equal to replacement.

^{6/} Capital required for only half of year because of capital turnover - two litters per year. Interest rate used was for only half a year.

^{7/} Estimated on a basis of 20 sow operating unit.

indicated that goals of 40 to 60 sows per operator may be attainable. At this level of production, annual labor returns to the operators would be considerably greater than those now obtained on most farms.

Hog-Fattening Enterprise

Combining the feeder pig enterprise with a plan for finishing part of the pigs for market may be necessary to strengthen the bargaining position of feeder

pig producers. If a glut develops in the feeder pig market, the operator would need an alternative way of disposing of his animals.

Hog raising and fattening is usually considered to be most practical in areas in which corn is produced. However, with mixed feeds available and with increasing efficiency of feed conversion, an efficient livestock farmer in the Eastern Ozarks will find hog fattening to be one of his more profitable enterprises. At 1953-57 price relationships and the operating efficiency assumed in Table 16, an operator would receive a return to land, labor, and capital of \$87.22 for each 2 litters of 7 pigs each that were fattened. This return would be only slightly less than that obtained from feeder pigs sold at the usual weight. However, the

TABLE 16-POTENTIAL RETURNS AND COSTS FOR FOURTEEN FAT HOGS IN EASTERN OZARKS OF MISSOURI 1/

Item	
Capital requirement	
Land <u>2/</u>	\$ 2.00
Buildings and equipment	20.00
Working capital	422.10
Returns	
Sale of 14 fat hogs at 200 pounds per hog (2,800 pounds)	509.32
Costs	
Purchase of 14 feeder pigs, weighing 62.6 pounds per pig at \$26.94 per 100 pounds (876.4 pounds)	236.10
Feed	
6,639 pounds of grain mix (472.2 pounds of mix per hog) <u>3/</u>	160.72
Veterinary and drugs <u>4/</u>	4.00
Depreciation and repairs on buildings <u>5/</u>	4.00
Death loss (1.5 of sale value) <u>6/</u>	7.64
Taxes and insurance on livestock and equipment <u>4/</u>	2.00
Miscellaneous <u>4/</u>	7.64
Total Costs	422.10
Net return to land, labor, and capital	87.22
Interest on working capital (1.5 percent) <u>7/</u>	6.33
Interest on buildings and equipment (6 percent) <u>8/</u>	2.40
Net return to land and labor	78.49
Interest on land (5 percent)	.10
Net return to labor	78.39
Productive man day equivalents <u>4/</u>	2.40

1/ Assumes 1953-57 price relationships, improved production practices and a specialized enterprise on a medium-sized farm.

2/ Land suitable for fattening operation was considered as unsuitable for grazing or crops. Land of this quality can be obtained for \$8.00 per acre.

3/ Ration used as indicated by Zobvisky, S. E., Naumann, H.S., Lasley, J. F., Brady, D. E. and Mullins, A. M. "Physical Composition of Swine During Growth and Fattening," University of Missouri Agricultural Experiment Research Station Bulletin 672, July, 1958, pp. 14, 16.

4/ University of Missouri Agricultural Extension BF 5606, 1956, pp. 8, 15.

5/ Depreciation and repairs computed on basis of 2 litters per year.

6/ Death loss estimated by county agents.

7/ Working capital needed for only three months.

8/ Estimated that at least two litters fattened per year using the same equipment.

capital requirement would be about 109 percent greater for the fattening operation. Yet the interest charge per 14 hogs fattened would be 10 percent less than for feeder pigs because of the shorter production period.

The land used for this type of operation would be similar in quality to that used for feeder pigs. The cost of providing it could be very low. If the land were rewarded, returns would be \$78.39 per 14 pigs fattened for market. Returns to the time spent in finishing approximately 10 litters would be \$3.27 per hour.

Poultry Laying Flock Enterprise

In 1954, chickens were kept on about 78 percent of the farms in Economic Area 8, yet only 32 percent of the farmers reported sales of eggs.¹³ Apparently on many farms, poultry raising was only a small sideline operation for home consumption. It is difficult to impute costs to this type of operation. Benefits received are not easily measured in money terms and even when so stated they are of little value in influencing the decisions of the farmers. If, however, the farmer looks on his poultry enterprise as a business that contributes to his family income, an input-output analysis may be meaningful. Most farmers in the area have the alternative of buying eggs from their neighbors or of producing them for home consumption and/or for sale.

Data obtained from poultry producers in Missouri for the period 1951-54 show that costs decreased and gross returns increased per unit as the size of flock increased. Output per hen increased, feed costs and other production expenses per unit of output were lowered, and the prices received for poultry went up as the size of flock increased. Economies of size that were reflected in the study mentioned were assumed in the various production alternatives presented in Table 17.

Farmers with fewer than 100 hens would not cover their operating costs. In fact, they would lose \$16 per 100 hens. Those with 250 hens would get a return of \$114 for their land, labor, and capital. However, if they rewarded the capital that was invested in poultry buildings and operating expenses at 6 percent, they would lose \$54 with flock of 250 hens. With flocks of 500 hens, operators would get \$618 return to labor. If 1,000 laying hens were kept, the return to labor would be \$1,314.

Broiler Enterprise

Broiler production is of recent origin in the Ozark Area. One of the major problems in broiler production has been the large volume of credit needed and the small return per unit of output. Slight reductions in prices received have brought disaster to growers. Most of the broilers are now produced under contract, with the feed dealers assuming a large share of the risk. The farmer supplies equipment, water, and labor, and the dealer furnishes the chicks, feed, and market outlet.

¹³United States Census of Agriculture, Vol. I, Part 10, 1954, p. 289.

The most common contract in this area for the period studied guaranteed the producer 6 cents a bird. Four broods can be marketed a year. Producers must have a capacity of at least 5,000 birds (20,000 a year) to obtain a contract. Thus an investment of about \$3,750 for buildings and \$1,000 for equipment is required to start broiler production in the Ozark Area (20,000 birds per year). A farmer with such an investment and with the price-cost relationships and production practices assumed in Table 18, could expect an annual return to land, labor, and capital of \$793. If the investment in buildings, equipment, and working capital is rewarded at 6 percent, labor would receive about 62 cents an hour for time spent on the enterprise. If 80,000 birds were marketed, labor would receive about 85 cents an hour. Indications are that future contract prices per bird may be lower.

TABLE 17-POTENTIAL RETURNS AND COSTS FOR A POULTRY ENTERPRISE OF SPECIFIED SIZES
IN EASTERN OZARKS OF MISSOURI 1/

Item	Number of Layers			
	100	250	500	1,000
	\$	\$	\$	\$
Capital requirement:				
Land	1.00	2.50	5.00	10.00
Buildings and equipment	845.00	1,450.00	2,975.00	5,380.00
Working capital	558.00	1,348.00	2,431.00	4,819.00
Returns:				
Egg receipts 2/	493.00	1,341.00	3,130.00	6,259.00
Stock sold 3/	49.00	121.00	243.00	486.00
Total	542.00	1,462.00	3,373.00	6,745.00
Costs:				
Feed 4/				
1st 8 weeks, 400 pounds grain mix per 100 birds	19.00	47.00	84.00	168.00
8-24 weeks, 2,000 pounds grain mix per 100 birds	82.00	205.00	360.00	720.00
52 weeks, 9,125 pounds grain mix per 100 birds	347.00	867.00	1,523.00	3,046.00
Chicks 5/	35.00	88.00	175.00	350.00
Insurance and taxes on buildings 6/	17.00	29.00	60.00	106.00
Depreciation on buildings 7/	42.00	72.00	149.00	269.00
Brooding and other miscellaneous costs 8/	16.00	40.00	80.00	160.00
Total Costs	558.00	1,348.00	2,431.00	4,819.00
Net return to land, labor, and capital	- 16.00	114.00	942.00	1,926.00
Interest on buildings, equipment, working capital (6 per cent)	84.00	168.00	324.00	612.00
Net return to land and labor	-100.00	- 54.00	618.00	1,314.00
Interest on land (5 per cent)	.05	.12	.25	.50
Net return to labor	-100.05	- 54.12	617.75	1,313.50
Productive man day equivalents 9/	25	60	100	150

- 1/ Assumes 1953-57 price relationships and improved practices.
- 2/ Number of eggs per hen were based upon State average (195 eggs per hen and a price of 33¢ per dozen for flock size of 250 hens. The returns to different flock sizes were adjusted to reflect differences in rates of production and prices received by the larger producers as indicated in an unpublished report on 454 flock owners in Missouri for the 1951-54 period by Schell H. Bodenhamer, Leonard A. Voss, and Walter Russell.
- 3/ Stock sold is estimated on a basis of 90 percent livability and an average weight of 4 1/2 pounds per hen. The average price received for poultry in the Ozarks, 1953-57.
- 4/ Feed requirements were those suggested in University of Missouri Agricultural Extension Service BF 5604, 1956, p. 66. These requirements were adjusted to different flock sizes on a basis of study by Bodenhamer, Voss, and Russell.
- 5/ Chick prices were based upon the average price of chicks in Missouri for month of March for years 1953-57, adjusted for 15 percent mortality and the cost of sexing.
- 6/ Taxes on laying flock were not included because laying flocks are generally not taxed in Missouri.

TABLE 18-POTENTIAL RETURNS AND COSTS FOR A BROILER ENTERPRISE OF SPECIFIED SIZES IN EASTERN OZARKS OF MISSOURI. 1/

Item	Capacity of Broiler House			
	5,000	10,000	15,000	20,000
	\$	\$	\$	\$
Capital required				
Land 2/	2.50	5.00	7.50	10.00
Buildings 3/	3,750.00	7,500.00	11,250.00	15,000.00
Equipment 4/	1,000.00	2,000.00	3,000.00	4,000.00
Working capital	383.00	765.00	1,148.00	1,530.00
Returns	1,176.00	2,352.00	3,528.00	4,704.00
Costs				
Buildings				
Depreciation 5/	188.00	375.00	563.00	750.00
Taxes and insurance 6/	75.00	150.00	225.00	300.00
Equipment				
Depreciation 7/	100.00	200.00	300.00	400.00
Taxes and insurance 6/	20.00	40.00	60.00	80.00
Total Costs	383.00	765.00	1,148.00	1,530.00
Net return to land, labor and capital	793.00	1,587.00	2,380.00	3,174.00
Interest on buildings, equipment and working capital (6 percent)	308.00	616.00	924.00	1,232.00
Net return to land and labor	485.00	971.00	1,456.00	1,942.00
Interest on land (5 percent)	.12	.25	.38	.50
Net return to labor	484.88	970.75	1,455.62	1,941.50
Productive man day equivalents 8/	78	130	180	228

1/ Assumes 1953-57 price relationships, improved production practices, and a specialized enterprise on a medium sized farm.

2/ Land investment of \$8.00 per acre.

3/ An assumed cost of 75¢ per bird per capacity-See University of Missouri Agricultural Extension Balanced Farming Handbook 5604, 1956, p. 63.

4/ An assumed cost of 20¢ per bird capacity-See Balanced Farming Handbook 5604, p. 63.

5/ Buildings estimated to last 20 years-straight-line depreciation used.

6/ Taxes and insurance estimated at 2 percent of replacement value.

7/ Equipment estimated to last 10 years-straight-line depreciation.

8/ University of Missouri Agricultural Extension BF 5606, 1956, p. 8.

Cropping Enterprises

In the analyses of livestock enterprises, home-produced grain and roughage consumed by the animals were charged at the sale price of the feeds in the area. To estimate total returns to a farm business, a farmer needs to know how much net return can be realized at these prices from crops produced on available cropland, as well as the returns from his livestock enterprises.

In Economic Area 8, crops have been made complementary to the livestock enterprises, the major purpose being to provide feed. In 1954, about half the cropland harvested was in hay crops, a fourth was in corn, and the rest was planted mainly to small grains, which were complementary to hay crops.¹⁴ It was assumed that these crops—small grain, corn, and hay—would continue to be grown in the future. But changes in methods of harvesting crops may be made in the future. Corn and sorghum silage can be used to increase the supply of feed for cattle and sheep. They will provide more roughage per acre than hay. Some of the alternatives presented later in this study were based on this change.

Variability in the quality of cropland on each farm also has a direct bearing on the cropping system. Some land is suitable only for grain and hay; some is adapted to corn production; some to pasture; and some to timber. Each farm presents a different problem and the solution can be reached only after detailed study of soils on the individual farm. As this procedure was not possible, it was assumed that the acreage planted to corn in 1955 would be used in the future either for grain or silage and that acreage in small grain or hay would be used for these crops. One practice that is common in the area is that of double cropping when grain and hay are produced. It was assumed, therefore, that if costs and returns were based on corn silage, corn, and a combination of lespedeza hay and small grains, the major alternatives in crop production would be covered.

Costs of production per acre, especially machinery costs, usually vary with the number of acres produced. In this area, even with no charge for labor, a farmer would need 37 acres of corn, 55 acres of corn silage, and 52 acres of lespedeza and small grains to make it cheaper for him to own the machinery needed for crops than to have the work done by a custom operator.¹⁵ Less than 1 percent of the farmers in the area had this number of acres in these crops in 1954. For this reason, it was assumed in the analysis in Table 19 that crop-production costs would be based on machinery costs at custom rates. Farmers with more acres of crops than those at which costs equal custom charges would be able to do their work at less expense than the cost used in the analysis.

In budgeting returns, it was assumed that 60 bushels of corn, 12 tons of corn silage, 1 ton of lespedeza hay, and 35 bushels of oats could be obtained from each acre in these crops. The annual amount of fertilizer required and the farming practice necessary to maintain these yields were estimated. Fertilizer applications were based on quantities of materials removed by the crops each year. No attempt was made to determine additional capital requirements necessary to bring soils to a condition under which these yields could be obtained.

¹⁴United States Census of Agriculture, Vol. I, Part 10, 1954, pp. 193, 197.

¹⁵Unpublished masters' thesis of Dale W. Wilson, "An Economic Analysis of the Capital Investment in Farm Machinery in the Ozarks of Southeastern Missouri," 1956.

TABLE 19-POTENTIAL RETURNS AND COSTS PER ACRE OF SELECTED FEED CROPS IN EASTERN OZARKS OF MISSOURI 1/

Item	Corn	Corn silage	Lespedeza and small grains
Average yields per acre			
Bushels	60	-	35 2/
Tons	-	12	1
	\$	\$	\$
Investment			
Land	152.00	152.00	152.00
Working capital	45.22	58.52	38.54
Returns			
Grain	77.40	---	27.65
Forage	---	87.12	21.03
Total	77.40	87.12	48.68
Costs			
Seed	1.34	1.34	1.70
Fertilizer 3/	17.86	17.86	9.42
Lime	1.59	1.59	1.59
Machinery 4/	22.10	35.40	23.50
Tax on land	1.55	1.55	1.55
Fences, repairs depreciation	.78	.78	.78
Total Costs	45.22	58.52	38.54
Net return to land, capital and management	32.18	28.60	10.14
Interest on working capital (6 percent)	2.71	3.51	2.31
Net return to land and management	29.47	25.09	7.83
Interest on land (5 percent)	7.60	7.60	7.60
Net return to management	21.87	17.49	.23

1/ Assumes 1953-57 price relationships, improved production practices and a specialized enterprise on a medium sized farm.

2/ Oats as grain crop, acreage is doubled cropped.

3/ Fertilizer applications were based upon the quantity of plant nutrients removed by the annual crop. No adjustments were made for the nutrients needed to bring the soils to the higher level.

4/ Machinery costs were estimated at the custom rate charge per acre.

The data presented in Table 19 show lower costs than would be incurred on the smaller farms if the operators owned their machinery. Also, in determining returns from various cropping practices, storage costs were not included.

Based on these practices, yields and price-cost assumptions, income to land, capital, and management would be \$32.18 per acre of corn, \$28.60 per acre of corn silage, and \$10.14 per acre of lespedeza hay and small grain. Because it was assumed that the work was all custom hired, the remainder after operating capital and land investment were rewarded at the current rate of interest would go to management. Management would have a return of \$21.87 per acre of corn, \$17.49 per acre of corn silage, and \$0.23 per acre of lespedeza hay and small grain.

OPPORTUNITIES FOR INCOME FROM A TYPICAL FARM

The enterprises that are most suitable for a given farming situation depend upon the nature of the farm resources, the preference of the operator, availability of markets, price-cost relationships, and many other factors. Each farm presents an individual organizational problem that can be resolved only after a detailed analysis of the resources controlled by the operator. However, because many farm businesses are similar, solution of the problems of a farm representative of a fairly homogeneous group has merit in indicating the kinds of adjustments that might be made in many farm businesses. For this reason, the potential returns were estimated for the optimum combinations of alternative enterprises for selected farms representative of each economic class. Each of the farms selected was operated by an owner.

In budgeting each farm, the major goal was to maximize the returns to land, labor, and capital on an annual basis. To represent conditions on a typical farm in the area, various limitations in the use of resources were imposed. These were:

1. *The cropland on each farm would be used for crops; the acreage was limited to the acreage cropped in 1955.*

2. *The choice of crops was limited to the kinds of crops grown in 1955. It was assumed, however, that projected yields per acre would be at the levels of the most efficient producers—60 bushels of corn, 12 tons of corn silage, 1 ton of lespedeza hay and 35 bushels of oats (double cropped)—which are somewhat higher than the selected farmers obtained in 1955. The annual amount of fertilizer required and the farming practices necessary to maintain these yields were estimated from experimental data.*

3. *The grazing land was kept the same as in 1955, and all grazing land was calculated as grazed unless capital limitations made the use of the grazing resources impractical. No improved production practices were used on the pasture and the grazing capacity of the pasture was assumed the same as in 1955.*

4. *The labor force of each farm was limited to 365 productive man-day equivalents per year on the Economic Class II farm, 300 days on Economic Class III to V farms, 200 days on the Economic Class VI farm, 150 days on the Residential farm, and 90 days on the Part-time farm. Labor was assumed to operate with the efficiency accomplished by moderately efficient operators on medium-sized farms in Missouri for the 1953-57 period.*

5. *The size of the feeder pig operations was limited to 60 sows and 840 feeder pigs. If feeder pigs were fattened, no more than 40 sows were kept and only half the pigs (280) were fattened each year. The rest of the pigs were sold as feeder pigs. It was considered that progressive farmers could manage efficiently this size of hog enterprise after a gradual increase from present levels. As major emphasis has been on feeder pig production, the fattening operation was included as a means of improving the marketing position of the feeder pig producer.*

6. *Credit advanced for farm purposes was limited to 52 percent of the value of the real estate and 50 percent of the value of other assets unless the operator had bor-*

rowed more than this amount in 1955, in which case the amount borrowed in 1955 was permitted. These limitations allow a farm operator more credit than most of the operators used in 1955.

7. If the machine needed for a particular crop operation was not owned in 1955, the operation was custom hired.

Economic Class II Farm

The operator was 49 years old and had been on this farm 10 years. He had completed high school, which is typical for operators of Class II farms. He had no health problems to limit his ability to work. The enterprises on the farm required 357 man-day equivalents of labor a year. No one in the family was interested in a job off the farm. The operator's wife had a high school education. The family included an 8-year-old daughter.

The farm contained 110 acres. About 46 acres were used for harvested crops, and 14 acres of cropland were in pasture. There were 15 acres of open permanent pasture and 35 acres of wood and wasteland. Sixteen animal units were grazed on the pasture. The livestock inventory consisted of 3 dairy cows, 20 sows, and 65 ewes. About 28,000 broilers were marketed during the year.

The operator obtained a return to land, labor, and capital investment of \$4,059 based upon 1953-57 prices. If operating capital had been rewarded at 6 percent return a year, and the investment in land, buildings, and equipment at 5 percent, the operator would have received a return to labor of \$2,537 per year, or \$0.71 per hour of work. The operator had invested \$15,183 of his own money and \$12,682 of borrowed capital. He had buildings to house a brood of 7,000 broilers and a barn with 2,000 square feet of storage space. Except for a hay baler, he owned enough farm machinery to take care of his cropping operations. Hay baling was custom hired.

Nine alternative production plans were budgeted for this farm (Table 20). Under each plan, the owner's capital investment was limited to his 1955 investment. With this limitation and others mentioned, it was found that none of the enterprises alone would utilize his labor as fully as the 1955 organization. Grazing enterprises were limited by lack of pasture or capital. When the yearlings were wintered, the capital limitations restricted expansion. If a Grade A dairy enterprise were adopted, scarcity of capital would restrict full utilization of the pasture.

Four enterprises (feeder pigs, feeder pigs—one litter fattened, laying hens, and broilers) provided a greater return to land, labor, and capital than the 1955 organization, though they did not use labor as fully. By expanding the feeder pig enterprise from 20 to 60 sows, buying 16 feeder yearlings in the spring to graze the pasture, and selling the hay, returns to owned land, labor, and capital after rewarding land, labor, and capital at current rates of interest, could have been boosted to \$8,086 compared with \$3,355 from the 1955 organization. Returns to labor would be increased from \$0.71 to \$2.35 per hour.

TABLE 20—PRESENT AND ALTERNATIVE FARM ORGANIZATIONS; INCOME, AND EXPENSES ON AN ECONOMIC CLASS
II FARM IN EASTERN OZARKS OF MISSOURI, 1953--57 PRICE RELATIONSHIPS

Item	Organization	Beef	Feeder	Sheep	Dairy	Dairy	Feeder		Laying	Broilers
	and practice in 1955	cow and calf	yearlings graze and winter		grade A market	grade C market	Feeder pigs	one litter 2/		
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Capital investment										
Land, buildings & equipment ^{3/}										
Owned	9,300	9,300	9,300	9,300	9,300	9,300	9,300	9,300	9,300	9,300
Borrowed	5,700	5,700	5,700	5,700	5,700	5,700	5,700	5,700	5,700	5,700
New buildings & equipment (owned)	---	---	---	---	---	---	---	---	1,901	1,901
New buildings & equipment (borrowed)	---	---	417	---	4,500	2,338	---	---	3,479	6,934
Machinery, owned	3,982	3,982	3,982	3,982	3,982	3,982	3,982	3,982	3,982	3,982
Livestock, breeding										
Owned	1,471	1,901	---	1,901	1,901	1,901	1,901	1,901	---	---
Borrowed	---	659	---	499	2,149	2,419	1,098	99	---	---
Operating expenses ^{4/}										
Owned	430	---	1,901	---	---	---	---	---	---	---
Borrowed	6,982	2,444	6,553	2,696	---	---	4,122	4,780	---	---
Total capital investment										
Owned	15,183	15,183	15,183	15,183	15,183	15,183	15,183	15,183	15,183	15,183
Borrowed	12,682	8,803	12,670	8,895	12,349	10,457	10,920	10,579	9,179	12,634
Total	27,865	23,986	27,853	24,078	27,532	25,640	26,103	25,762	24,362	27,817
Land Use	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Corn for grain	30.0	30.0	20.0	30.0	20.0	20.0	30.0	30.0	30.0	30.0
Corn for silage	---	---	10.0	---	10.0	10.0	---	---	---	---
Hay and small grain	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Cropland pasture	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Permanent pasture	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Woodland and wasteland	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Total	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0
Livestock organization	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)
Beef cows	---	16	---	---	---	---	---	---	---	---
Feeder calves, winter & graze	---	---	16	---	---	---	---	---	---	---
Feeder calves, winter	---	---	72	---	---	---	---	---	---	---
Feeder yearlings, graze	---	---	---	---	---	---	16	16	16	16
Ewes	65	---	---	80	---	---	---	---	---	---
Dairy cows	3	---	---	---	15	16	---	---	---	---
Laying hens	---	---	---	---	---	---	---	---	2,000 ^{5/}	---
Sows	20	---	---	---	---	---	60	40	---	---

TABLE 20-CONTINUED

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Dairy grade A market	Dairy grade C market	Feeder pigs one litter 1/fattened 2/	Laying hens	Broilers	
Hogs	---	---	---	---	---	---	280	---	---	
Broilers	28,000	---	---	---	---	---	---	---	65,200	
Receipts	\$	\$	\$	\$	\$	\$	\$	\$	\$	
Crops	579	2,550	1,512	2,386	1,196	1,066	336	336	3,111	
Livestock	21,412	1,200	9,993	2,376	5,067	3,648	16,292	17,032	15,616	6,038
ACP payments	300	300	300	300	300	300	300	300	300	
Total	22,291 ^{6/}	4,050	11,805	5,062	6,563	5,014	16,928	17,668	16,252	9,449
Expenses										
Crops ^{7/}	2,033	1,770	1,987	1,770	1,879	1,879	1,770	1,770	1,770	
Livestock	16,041	516	7,022	768	1,193	1,135	6,316	7,632	10,177	3,127
Other	158	158	158	158	158	158	158	158	158	
Total	18,232	2,444	9,167	2,696	3,230	3,172	8,244	9,560	12,105	5,055
Income to land, labor and capital	4,059	1,606	2,638	2,366	3,333	1,842	8,684	8,108	4,147	4,394
Interest on operating capital (6 percent)	772	539	576 ^{8/}	545	482	498	666	646	239	239
Income to land and labor	3,287	1,067	2,062	1,821	2,851	1,344	8,018	7,462	3,908	4,155
Interest on land, blgs. and eqpt. (5 percent)	750	750	771	750	975	867	750	750	1,019	1,191
Income to labor	2,537	317	1,291	1,071	1,876	477	7,268	6,712	2,889	2,964
Interest on borrowed capital	704	471	529	477	639	547	598	578	459	632
Income to owned land, labor and capital	3,355	1,135	2,109	1,889	2,694	1,295	8,086	7,530	3,688	3,762
Return per day of labor	7.11	3.69	10.25	12.03	9.20	2.34	23.45	24.86	8.35	12.25
	(days)	(days)	(days)	(days)	(days)	(days)	(days)	(days)	(days)	(days)
Productive man day equivalents ^{9/}	357	86	126	89	204	204	310	270	346	242

1/ Limited to 60 sows.

2/ Limited to 40 sows and one litter fattened.

3/ Land, buildings and equipment are considered as land.

4/ Adjusted to reflect capital turnover.

5/ Costs and labor efficiency per 100 hens were assumed to be the same for flocks of 2,000 hens as indicated in Table 17 for 1,000 hens.

6/ Includes value of inventory change and value of home consumed products.

7/ Machinery costs are based upon operating and depreciation of owned equipment and custom rates when machines were not owned for particular job. Other expenses as estimated in Table 20.

8/ \$5,685 needed for only 6 months.

9/ University of Missouri Agricultural Extension B.F. 5606, 1956, p. 8.

Because prices of cattle, hogs, milk, and poultry products vary differently from year to year, the relationships among prices change—sometimes even more than the prices of individual products. In 1959, for example, prices of hogs, milk, and corn were lower and prices of cattle were higher than in 1953-57. Thus at 1959 prices, the advantage of a hog-type of farming over other types would not have been as great as shown in the foregoing analyses. But even at 1959 prices when hogs were at the bottom of a price cycle, the relative positions of the alternative types of farming would not differ. The hog and poultry types would still be more profitable than the organization used in 1955.

Economic Class III Farm

The operator of this farm was 33 years old. He had a high school education and his wife had a college degree. She taught school in the area at a salary of \$2,100 a year. Both husband and wife were in good health. There were no children.

The operator had obtained the farm from his father and had been on it for 11 years. The farm contained 260 acres, of which 94 acres were cropped. It had two relatively new barns with 2,500 square feet of floor space. About 22 animal units were grazed on the pasture. The livestock inventory included 16 beef cows, 6 yearlings, and 12 sows. Fourteen calves and 148 hogs were marketed during the year. In addition to raising enough feed for his livestock, the operator sold \$1,019 worth of crops. However, \$1,052 worth of concentrates were purchased to feed the hogs. The operator's net worth statement showed \$38,680 owned.

The enterprises on the farm in 1955 required about 216 days of labor. The operator thought he needed a bigger farm business or an off-farm job to keep him busy. Under the 1955 organization, he received, at 1953-57 prices, a return of \$3,414 to owned land, labor, and capital. If land and capital had been rewarded at current rates of interest, the operator would have received a return of \$1,379 per year for labor, or \$0.64 per hour of work.

The limited carrying capacity of the pasture and production of roughage on the farm prevented the full utilization of the operator's labor on enterprises that depended mainly on use of forage. Consequently, in seeking a better production program, the enterprises that needed only limited acreages were expanded to utilize fully the operator's labor of 300 man-day equivalents. All of the nine alternative plans budgeted, except the beef cows and calf and dairy Grade C market enterprises, offered a higher return to land, labor, and capital than the current organization (Table 21). Returns varied from \$2,976 for the beef cow and calf enterprise to \$9,315 for the combination of feeder pigs, hog fattening, and summer grazing of yearling steers.

Annual returns to labor also were greater from all except two of the alternative plans. The capital requirements of the various plans varied from \$38,266 to \$55,013. Five of the plans required more capital than was invested in the 1955 farm business.

TABLE 21-PRESENT AND ALTERNATIVE FARM ORGANIZATION, INCOME, AND EXPENSES ON AN ECONOMIC CLASS III FARM IN EASTERN OZARKS OF MISSOURI, 1953-57 PRICE RELATIONSHIPS

Item	Beef	Feeder	Dairy	Dairy	Feeder		Laying	Broilers		
	Organization and practice in 1955	cow and calf	yearlings graze and winter	Sheep	grade A market	grade C market			pigs one litter 1/fattened 2/	hens
	\$	\$	\$	\$	\$	\$	\$	\$	\$	
Capital investment:										
Land, buildings and equipment ^{3/}										
Owned	28,525	28,525	28,525	28,525	28,525	28,525	28,525	28,525	28,525	28,525
Borrowed	---	---	---	---	---	---	---	---	---	---
New buildings and equipment (owned)	---	---	2,655	---	6,292	660	---	---	6,851	6,851
New buildings and equipment (borrowed)	---	---	---	---	---	---	---	---	1,219	12,149
Machinery, owned	3,304	3,304	3,304	3,304	3,304	3,304	3,304	3,304	3,304	3,304
Livestock, breeding:										
Owned	3,555	3,300	---	3,300	559	5,940	2,600	2,000	---	---
Borrowed	---	---	---	---	5,381	---	---	---	---	---
Operating expenses ^{4/}										
Owned	3,296	3,137	4,196	3,484	---	---	3,981	4,851	---	---
Borrowed	---	---	16,333	---	---	---	---	152	---	---
Total capital investment:										
Owned	38,680	38,266	38,680	38,613	38,680	38,429	38,410	38,680	38,680	38,680
Borrowed	---	---	16,333	---	5,381	---	---	152	1,219	12,149
Total	38,680	38,266	55,013	38,613	44,061	38,429	38,410	38,832	39,899	50,829
Land Use:	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Corn for grain	21	21	---	21	21	21	21	21	21	21
Corn for silage	---	---	21	---	---	---	---	---	---	---
Hay and small grain	69	69	69	69	69	69	69	69	69	69
Cropland pasture	---	---	---	---	---	---	---	---	---	---
Permanent pasture	36	36	36	36	36	36	36	36	36	36
Woodland and wasteland	134	134	134	134	134	134	134	134	134	134
Total	260	260	260	260	260	260	260	260	260	260
Livestock organization	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Beef cows	16	22	---	---	---	---	---	---	---	---
Feeder calves, winter and graze	6	---	22	---	---	---	---	---	---	---
Feeder calves, winter	---	---	197	---	---	---	---	---	---	---
Feeder yearlings, graze	---	---	---	---	---	---	22	22	22	22
Ewes	---	---	---	110	---	---	---	---	---	---
Dairy cows:	---	---	---	---	22	22	---	---	---	---
Sows	12	---	---	---	---	---	52	40	---	---

TABLE 21-CONTINUED

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Dairy grade A market	Dairy grade C market	Feeder pigs one litter	Laying hens	Broilers	
Hogs	120	---	---	---	---	---	280	---	---	
Laying hens	---	---	---	---	---	---	---	1,500 ^{5/}	---	
Broilers	---	---	---	---	---	---	---	---	80,000	
Receipts:	\$	\$	\$	\$	\$	\$	\$	\$	\$	
Crops	1,019	4,424	914	3,987	2,120	2,120	1,451	1,451	1,451	4,984
Livestock	5,651	1,649	24,451	3,267	7,427	5,016	15,200	17,831	13,041	7,627
ACP Payments	40	40	40	40	40	40	40	40	40	40
Total	6,710 ^{6/}	6,113	25,405	7,294	9,587	7,176	16,691	19,322	14,532	12,651
Expenses:										
Crops ^{7/}	1,787	2,244	2,627	2,244	2,244	2,244	2,244	2,244	2,244	2,244
Livestock	1,325	709	17,718	1,056	1,749	1,560	6,301	7,579	6,281	4,115
Other	184	184	184	184	184	184	184	184	184	184
Total	3,296	3,137	20,529	3,484	4,177	3,988	8,729	10,007	8,709	6,543
Income to land, labor and capital	3,414	2,976	4,876	3,810	5,410	3,188	7,962	9,315	5,823	6,108
Interest on operating capital (6 percent)	609	584	956 ^{8/}	605	555	555	593	618	198	198
Income to land, and labor	2,805	2,392	3,920	3,205	4,855	2,633	7,369	8,697	5,625	5,910
Interest on land, bldgs. and eqpt. (5 percent)	1,426	1,426	1,559	1,426	1,741	1,459	1,426	1,426	1,830	2,376
Income to labor	1,379	966	2,361	1,779	3,114	1,174	5,943	7,271	3,795	3,534
Interest on borrowed capital	---	---	506	---	323	---	---	9	61	607
Income to owned land, labor and capital	3,414	2,976	4,870	3,810	5,087	3,188	7,962	9,306	5,762	5,501
Return per day of labor	6.38	7.85	9.01	15.21	10.89	4.10	20.01	24.82	12.91	11.90
Productive man day equivalents ^{9/}	(days) 216	(days) 123	(days) 262	(days) 117	(days) 286	(days) 286	(days) 297	(days) 293	(days) 294	(days) 297

^{1/} Limited to 60 sows.

^{2/} Limited to 40 sows and one litter fattened.

^{3/} Land, buildings, and equipment are considered as land.

^{4/} Adjusted to reflect capital turnover.

^{5/} Costs and labor efficiency per 100 hens were assumed to be the same for flocks of 1,500 hens as indicated in Table 17 for 1,000 hens.

^{6/} Includes value of inventory change and values of home-consumed products.

^{7/} Machinery costs are based on operating and depreciation of owned equipment and custom rates when machines were not owned for a particular job. Other expenses as indicated in Table 20.

^{8/} \$15,776 needed for only 6 months.

^{9/} University of Missouri agricultural Extension B.F. 5606, 1956, p. 8.

If the operator were to expand the feeder pig enterprise to 40 sows with half the pigs fattened and 22 yearling steers grazed in summer, he would almost triple his income. If, however, he wanted to keep cattle only, feeder yearlings grazed and wintered would be the best enterprise. To obtain these higher returns, he would need to increase the roughage produced on the farm by using the corn for silage. The sheep enterprise would provide him with the best income if he wanted to utilize only his pasture. However, because the operator indicated he needed more work, it seems that a shift to a more intensive enterprise such as feeder pigs would be logical.

Economic Class IV Farm

The operator of this farm has lived on it 17 years. He was 59 years old in 1955. Both he and his wife have eighth grade educations. They indicated they both enjoyed good health. The farm enterprises required 188 days of labor a year under standard rates of achievement. The operator was capable of working 300 days a year. He indicated that he was not interested in an off-farm job.

The farm contained 320 acres with only 50 acres in crops. None of the cropland was planted to corn. The operator indicated that the soil was not suited to this crop. Carrying capacity of the 120 acres in pasture was low, as only 26 animal units were grazed. There were 150 acres in timber, and \$268 worth of saw logs were sold in 1955. The livestock inventory included 17 beef cows, 6 yearlings, 3 dairy cows, 6 hogs, and 45 laying hens. The farm had a barn with 1,400 square feet of floor space, and a chicken house had 576 square feet. Both of these buildings were 20 years old.

With his 1955 farm organization, the operator had a return to land, labor, and capital of \$1,533 with 1953-57 prices. If capital and land had been rewarded at the current rate of interest, the operator would have received \$640 a year, or \$0.34 per hour for his labor.

Capital limitation would make it impossible to expand Grade A dairy or broiler enterprises to permit full utilization of the labor resources (Table 22). Also, the limited land resource would restrict expansion of all enterprises that utilized grazing and roughage crops except the grade C dairy enterprise. Hence, the labor resources were under-employed in these enterprises. Only enterprises that needed a limited land resource would use the operator's labor fully. However, all of the alternative organizations except a beef cow-calf enterprise would have returned more to land, labor, and owned capital than the 1955 organization. Returns to land, labor, and owned capital varied from \$992 to \$8,033. Returns to labor after rewarding the other factors used in production varied from \$99 per year on a beef cow-calf enterprise to \$7,140 on a feeder pig enterprise. If the operator desired to increase his income materially, he would need to shift to enterprises that require less cropland or expand his land holdings. The former alternative is probably the most feasible.

TABLE 22-PRESENT AND ALTERNATIVE FARM ORGANIZATIONS, INCOME, AND EXPENSES ON AN ECONOMIC CLASS IV FARM IN EASTERN OZARKS OF MISSOURI, 1953-57 PRICE RELATIONSHIP

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Dairy grade A market	Dairy grade C market	Feeder pigs 1/	Feeder one litter 2/	Laying hens	Broilers
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Capital investment:										
Land, buildings and equipment; 3/										
Owned	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Borrowed	---	---	---	---	---	---	---	---	---	---
New Buildings and equipment (owned)	---	---	---	---	---	---	---	---	5,580	5,580
New Buildings and equipment (borrowed)	---	---	---	---	7,150	3,458	---	---	3,566	8,385
Machinery, owned	972	972	972	972	972	972	972	972	972	972
Livestock, breeding										
Owned	3,305	3,900	---	3,900	5,580	5,580	3,000	2,000	---	---
Borrowed	---	---	---	---	1,170	1,440	---	---	---	---
Operating expenses 4/										
Owned	2,275	1,680	5,580	1,680	---	---	2,580	3,580	---	---
Borrowed	---	796	194	1,206	---	---	2,681	2,339	---	---
Total capital investment:										
Owned	16,552	16,552	16,552	16,552	16,552	16,552	16,552	16,552	16,552	16,552
Borrowed 5/	---	796	194	1,206	8,320	4,898	2,681	2,339	3,566	8,385
Total	16,552	17,348	16,746	17,758	24,872	21,450	19,233	18,891	20,118	24,937
Land use:	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Corn for grain	---	---	---	---	---	---	---	---	---	---
Corn for silage	---	---	---	---	---	---	---	---	---	---
Hay and small grain	50	50	50	50	50	50	50	50	50	50
Cropland pasture	110	110	110	110	110	110	110	110	110	110
Permanent pasture	10	10	10	10	10	10	10	10	10	10
Woodland and wasteland	150	150	150	150	150	150	150	150	150	150
Total	320	320	320	320	320	320	320	320	320	320
Livestock Organization;	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Beef cows	17	26	---	---	---	---	---	---	---	---
Feeder calves, winter and graze	6	---	26	---	---	---	---	---	---	---
Feeder calves, winter	---	---	23	---	---	---	---	---	---	---
Feeder yearlings. graze	---	---	---	---	---	---	26	26	26	6/
Ewes	---	---	---	130	---	---	---	---	---	---
Dairy	3	---	---	---	25	26	---	---	---	---
Sows	---	---	---	---	---	---	60	40	---	---

TABLE 22-CONTINUED

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Dairy grade A market	Dairy grade C market	Feeder pigs one litter	Laying hens	Broilers
Hogs	6	---	---	---	---	---	---	- 280	---
Laying hens	45	---	---	---	---	---	---	1,700 ^{7/}	---
Broilers	---	---	---	---	---	---	---	---	58,800
Receipts:	\$	\$	\$	\$	\$	\$	\$	\$	\$
Crops (including timber)	853	1,523	1,382	1,256	---	---	1,052	1,052	2,434
Livestock	2,911	1,949	5,968	3,861	8,440	5,928	17,620	18,362	14,921
ACP payments	44	44	44	44	44	44	44	44	44
Total	3,808 ^{8/}	3,516	7,394	5,161	8,484	5,972	18,716	19,458	16,017
Expenses:									
Crops ^{9/}	1,149	1,482	1,482	1,482	1,482	1,482	1,482	1,482	1,482
Livestock	970	838	4,136	1,248	2,808	2,794	8,884	10,200	9,865
Other	156	156	156	156	156	156	156	156	156
Total	2,275	2,476	5,774	2,886	4,446	4,432	10,522	11,838	11,503
Income to land, labor and capital	1,533	1,040	1,620	2,275	4,038	1,540	8,194	7,620	4,514
Interest on operating capital (6 percent)	393	441	350 ^{10/}	465	463	480	554	533	58
Income to land and labor	1,140	599	1,270	1,810	3,575	1,060	7,640	7,087	4,456
Interest on land, bldgs. and eqpt. (5 percent)	500	500	500	500	858	673	500	500	957
Income to labor	640	99	770	1,310	2,717	387	7,140	6,587	3,499
Interest on borrowed capital	---	48	12	72	428	259	161	140	178
Income to owned land, labor and capital	1,533	992	1,608	2,203	3,610	1,281	8,033	7,480	4,336
Return per day of labor	3.40	1.00	9.87	13.65	9.67	1.33	23.96	24.76	12.11
	(days)	(days)	(days)	(days)	(days)	(days)	(days)	(days)	(days)
Productive man day equivalents ^{11/}	188	99	78	96	281	291	298	266	289

^{1/} Limited to 60 sows.^{2/} Limited to 40 sows and one litter fattened.^{3/} Land, buildings, and equipment are considered as land.^{4/} Adjusted to reflect capital turnover.^{5/} Borrowed capital limited to \$8,476.^{6/} Limited capital makes enterprise impractical.^{7/} Costs and labor efficiency per 100 hens were assumed to be the same for flocks of 1,700 hens as indicated in Table 17 for 1,000 hens.^{8/} Includes value of inventory change and value of home-consumed products.^{9/} Machinery costs are based upon operating costs and depreciation of owned equipment and custom rates when machine was not owned to do a particular job. Other expenses estimated as indicated in Table 19.^{10/} \$1,842 needed for 6 months.^{11/} University of Missouri Agricultural Extension BF 5606, 1956, p. 8.

Economic Class V Farm

This 640 acre farm was purchased in 1945 and is currently free of debt. The operator had a net worth of \$17,060 in 1955. The farmer and his wife were each 53 years of age in 1955. Both had completed the eighth grade. The wife had taught in the grade schools of Missouri for a number of years, but no longer wanted to work off the farm. Both husband and wife were in good health.

The farm enterprises on this place required about 197 days of labor per year. Although there were no children, neither the operator nor his wife indicated interest in another job. Based on 1953-57 prices, the farm business in 1955 produced a net return of \$754 to land, labor, and capital. If land and operating capital had been rewarded at the prevailing rate of interest in the area, the operator would have lost \$170, which would have represented a loss equivalent to \$0.86 for each day the operator worked on the farm. The enterprises included 12 acres of corn, 50 acres of hay and small grain, 63 acres of cropland pasture, and 515 acres of woodland. The livestock organization consisted of 26 beef cows, 5 sows, and 15 laying hens. Sales in 1955 included 80 fat hogs and 25 calves.

Three of the nine different livestock organizations budgeted in Table 23 could not be expanded to fully utilize the operator's labor resource because of the limited amount of grazing or cropland. Among the enterprises that require only a limited amount of land, only the broiler and feeder pig-hog fattening enterprises could not be expanded to utilize the operator's labor fully. The broiler enterprise was limited by capital and the feeder pig-hog fattening enterprise by the assumption of 40 sows as the maximum size.

All of the alternative enterprises that were budgeted yielded a greater return to land, labor, and owned capital than the 1955 organization; returns varied from \$1,131 to \$7,667. Returns to labor varied from \$1.62 per day for the beef cow and calf enterprise to \$24.53 per day for the feeder pig-hog fattening enterprise. Feeder pigs offered the best alternative for increasing the operator's income of any of the enterprises budgeted.

Economic Class VI Farm

The operator of this 411-acre farm had lived on this place for 16 years. He and his wife were 46 years old. He had an eighth grade education. He stated that he had a health problem which limited his ability to work. In 1955, the enterprises on this place required only 176 days of labor. The wife stated that her health was good but that she was not interested in an off-farm job. The couple had no children.

Based on 1953-57 prices, the farmer obtained a net return of \$293 for his labor and for the capital he had invested in the business in 1955. If capital had been rewarded at current rates of interest, he would have lost the equivalent of \$3.61 for each day he worked on the farm. In 1955, the livestock organization included 31 beef cows, 4 dairy cows, 3 sows, and 129 laying hens. Ten percent of the chickens, 15 percent of the cattle, and 35 percent of the hogs died during

TABLE 23-PRESENT AND ALTERNATIVE FARM ORGANIZATIONS, INCOME, AND EXPENSES ON AN ECONOMIC CLASS V FARM IN EASTERN OZARKS OF MISSOURI, 1953-57 PRICE RELATIONSHIPS

Item	Beef	Feeder		Dairy	Dairy	Feeder	Laying		
	Organization cow and practice and in 1955	cow calf	yearlings graze and winter	Sheep	grade A market	grade C market	one litter pigs 1/2	hens	Broilers
	\$	\$	\$	\$	\$	\$	\$	\$	\$
Capital investment:									
Land and buildings <u>3/</u>									
Owned	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Borrowed	---	---	---	---	---	---	---	---	---
New buildings and equipment (owned)	---	---	504	---	---	---	---	5,286	5,286
New buildings and equipment (borrowed)	---	---	---	---	6,864	3,192	---	2,784	8,014
Machinery, owned	1,774	1,774	1,774	1,774	1,774	1,774	1,774	1,774	1,774
Livestock, breeding									
Owned	3,115	3,900	---	3,900	5,286	5,286	2,650	2,000	---
Borrowed	---	---	---	---	1,194	1,194	---	---	---
Operating expenses <u>4/</u>									
Owned	2,171	1,386	4,782	1,386	---	---	2,636	3,286	---
Borrowed	---	1,777	8,120	2,187	---	---	2,084	2,512	---
Total capital investment									
Owned	17,060	17,060	17,060	17,060	17,060	17,060	17,060	17,060	17,060
Borrowed	---	1,777	8,120	2,187	8,058	4,386	2,084	2,512	8,014
Total	17,060	18,837	25,180	19,247	25,118	21,446	19,144	19,572	25,074
Land Use:	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Corn for grain	12	12	---	12	12	12	12	12	12
Corn for silage	---	---	12	---	---	---	---	---	---
Hay and small grain	50	50	50	50	50	50	50	50	50
Cropland pasture	63	63	63	63	63	63	63	63	63
Permanent pasture	---	---	---	---	---	---	---	---	---
Woodland and wasteland	515	515	515	515	515	515	515	515	515
Total	640	640	640	640	640	640	640	640	640
Livestock Organization;	No.	No.	No.	No.	No.	No.	No.	No.	No.
Beef cows	26	26	---	---	---	---	---	---	---
Feeder calves, winter and graze	---	---	26	---	---	---	---	---	---
Feeder calves, winter	---	---	109	---	---	---	---	---	---
Yearlings, graze	---	---	---	---	---	26	26	26	26
Ewes	---	---	---	130	---	---	---	---	---
Dairy cows	---	---	---	---	24	24	---	---	---
Sows	5	---	---	---	---	---	53	40	---
Hogs	---	---	---	---	---	---	---	280	---

TABLE 23-CONTINUED

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Dairy grade A market	Dairy grade C market	Feeder pigs one litter 1/fattened 2/	Laying hens	Broilers	
Laying hens	15	---	---	---	---	---	---	1,500 5/	---	
Broilers	---	---	---	---	---	---	---	---	56,000	
Receipts:	\$	\$	\$	\$	\$	\$	\$	\$	\$	
Crop	830	2,452	---	2,185	239	239	1,052	1,052	1,052	3,363
Livestock	2,095	1,949	15,366	3,861	8,102	5,472	15,967	18,362	13,572	6,814
ACP payments	---	---	---	---	---	---	---	---	---	---
Total	2,925 6/	4,401	15,366	6,046	8,341	5,711	17,019	19,414	14,624	10,177
Expenses:										
Crops 7/	1,315	2,109	2,314	2,109	2,109	2,109	2,109	2,109	2,109	2,109
Livestock	640	838	10,372	1,248	1,908	1,702	7,114	9,271	7,973	4,126
Other	216	216	216	216	216	216	216	216	216	216
Total	2,171	3,163	12,902	3,573	4,233	4,027	9,439	11,596	10,298	6,451
Income to land, labor and capital	754	1,238	2,464	2,473	4,108	1,684	7,580	7,818	4,326	3,726
Interest on operating capital (6 percent)	424	530	613 8/	555	495	495	549	574	106	106
Income to land and labor	330	708	1,851	1,918	3,613	1,189	7,031	7,244	4,220	3,620
Interest on land, bldgs. and eqpt. (5 percent)	500	500	525	500	843	660	500	500	904	1,165
Income to labor	- 170	208	1,327	1,418	2,770	529	6,531	6,744	3,316	2,455
Interest on borrowed capital	---	107	244	131	415	231	125	151	139	401
Income to owned land, labor and capital	754	1,131	2,220	2,342	3,693	1,453	7,455	7,667	4,187	3,325
Return per day of labor	-0.86	1.62	7.48	11.34	9.23	1.76	22.06	24.53	11.51	10.63
Productive man day equivalents 9/	(days) 197	(days) 128	(days) 185	(days) 125	(days) 300	(days) 300	(days) 296	(days) 275	(days) 288	(days) 231

1/ Limited to 60 sows.

2/ Limited to 40 sows and one litter fattened.

3/ Land, buildings and equipment are considered as land.

4/ Adjusted to reflect capital turnover.

5/ Costs and labor efficiency per 100 hens were assumed to be the same for flocks of 1,500 hens as indicated in Table 17 for 1,000 hens.

6/ Includes value of inventory change and value of home-consumed products.

7/ Machinery costs based upon operating costs and depreciation of owned equipment and custom rates when machine was not owned for a particular job.

8/ \$8,902 needed for six months.

9/ University of Missouri Agricultural BF 5606, 1956, p. 8.

the year. The chickens laid 64 eggs per hen, and the dairy cows produced 2,000 pounds of milk per cow. This low efficiency in handling livestock was typical for this class of farm, but it is assumed that this operator could attain average efficiency.

The cropping system included 4 acres of corn, 54 acres of hay and small grains, and 100 acres of cropland pasture. Thirty-five animal units of livestock were grazed on the pasture. There were 253 acres of woodland, from which firewood was harvested as needed. The farm had a barn with 800 square feet of floor space and a small chicken house. There was enough machinery to handle the crops except for hay baling, combining, and corn picking. These tasks were done with custom-hired equipment.

All of the alternative plans that were budgeted yielded a greater return to land, labor, and capital than the 1955 organization (Table 24). The major reason was the assumed increase in efficiency of operation. The capital limitation did not limit expansion of any of the alternative enterprises to a size that would not fully utilize the operator's labor. A combination of feeder pigs, hogs fattened, and steers grazed during the summer would provide the largest return—\$5,413 to land, labor, and owned capital. This would be a return of \$22.76 for each day of work. However, past experience suggests limitations in this operator's ability to handle the livestock currently on the place, and some other enterprise may be better. For example, 175 ewes, which would have required only 124 days of labor, would have yielded him 8 times his 1955 income.

Part-Time Farm

The operator of this farm was 49 years old. In 1955, he earned \$4,000 at his off-farm job. His 38-year-old wife had a high school education and devoted her time to taking care of the home and their two small children. The health of both adults was good.

The enterprises on this farm in 1955 required 90 days of labor and brought a net loss of \$72 after paying operating expenses. If capital had been rewarded at current rates, the operator would have sustained a loss equivalent to \$9.97 for each day he worked at farming (Table 25). The livestock enterprises included 15 beef cows, 6 brood sows, and 12 hens. Apparently, low rates of production were the major reason for the unsatisfactory income from farming. Only three of the cows raised calves in 1955. The sows raised one litter of pigs each and the hens laid about 100 eggs each. With these rates of production, there is little chance of improving the farm income. It is assumed, however, that the operator could become moderately efficient.

The cropping system included 7 acres of corn and 19 acres of lespedeza hay and small grain. The operator hired most of the cropping work done. He had two barns on the place with 1,800 square feet of floor space, a relatively new tractor, and most of the equipment needed to plant and cultivate his crops. But he had no harvesting equipment.

TABLE 24-PRESENT AND ALTERNATIVE FARM ORGANIZATIONS, INCOME, AND EXPENSES ON AN ECONOMIC CLASS VI FARM IN EASTERN OZARKS OF MISSOURI 1953-57 PRICE RELATIONSHIPS

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Dairy grade A market	Dairy grade C market	Feeder pigs one litter	Laying hens	Broilers	
	\$	\$	\$	\$	\$	\$	\$	\$	\$	
Capital Investment:										
Land and buildings ^{3/}										
Owned	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Borrowed	---	---	---	---	---	---	---	---	---	---
New buildings and equipment (owned)	---	---	168	---	---	---	---	3,439	3,439	---
New buildings and equipment (borrowed)	---	---	---	---	4,576	2,128	---	1,941	7,961	---
Machinery, owned	2,044	2,044	2,044	2,044	2,044	2,044	2,044	2,044	2,044	2,044
Livestock, breeding										
Owned	1,969	26	---	3,439	3,439	3,439	1,800	1,300	---	---
Borrowed	---	5,224	---	1,811	881	881	---	---	---	---
Operating expenses ^{4/}										
Owned	1,470	3,413	3,271	---	---	---	1,639	2,139	---	---
Borrowed	---	---	5,936	3,965	---	---	2,849	3,170	---	---
Total capital investment:										
Owned	17,483	17,483	17,483	17,483	17,483	17,483	17,483	17,483	17,483	17,483
Borrowed	---	5,224	5,936	5,776	5,457	3,009	2,849	3,170	1,941	7,961
Total	17,483	22,707	23,419	23,259	22,940	20,492	20,332	20,653	19,424	25,444
	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Land use:										
Corn for grain	4	4	4	4	4	4	4	4	4	4
Corn for silage	---	---	---	---	---	---	---	---	---	---
Hay and small grain	54	54	54	54	54	54	54	54	54	54
Cropland pasture	100	100	100	100	100	100	100	100	100	100
Permanent pasture	---	---	---	---	---	---	---	---	---	---
Woodland and wasteland	253	253	253	253	253	253	253	253	253	253
Total	411	411	411	411	411	411	411	411	411	411
Livestock Organization:										
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Beef cows	31	35	---	---	---	---	---	---	---	---
Feeder calves, winter and graze	---	---	35	---	---	---	---	---	---	---
Feeder calves, winter	---	---	47	---	---	---	---	---	---	---
Feeder yearlings, graze	---	---	---	---	---	---	---	---	---	---
Ewes	---	---	---	175	---	---	35	35	35	35
Dairy cows	4	---	---	---	16	16	---	---	---	---
Sows	3	---	---	---	---	---	36	28	---	---

TABLE 24-CONTINUED

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Dairy grade A market	Dairy grade C market	Feeder pigs one litter 1/fattened	Laying 2/ hens	Broilers
Hogs	---	---	---	---	---	---	196	---	---
Laying hens	129	---	---	---	---	---	---	1,000	---
Broilers	---	---	---	---	---	---	---	---	48,000
	\$	\$	\$	\$	\$	\$	\$	\$	\$
Receipts									
Crops	610	1,713	1,301	1,353	856	856	1,136	1,136	1,136
Livestock	1,153	2,624	9,786	5,198	5,402	3,648	12,913	15,085	11,395
ACP payments	---	---	---	---	---	---	---	---	---
Total	1,763 ^{5/}	4,337	11,087	6,551	6,258	4,504	14,049	16,221	12,531
Expenses									
Crops ^{6/}	1,149	2,112	2,180	2,112	2,112	2,112	2,112	2,112	2,112
Livestock	148	1,128	6,854	1,680	1,272	1,135	6,690	8,333	7,183
Other	173	173	173	173	173	173	173	173	173
Total	1,470	3,413	9,207	3,965	3,557	3,420	8,975	10,618	9,468
Income to land, labor, and capital	293	924	1,880	2,586	2,701	1,084	5,074	5,603	3,063
Interest on operating capital (6 percent)	329	642	562 ^{7/}	676	382	382	500	519	123
Income to land and labor	- 036	282	1,318	1,910	2,319	702	4,574	5,084	2,940
Interest on land, bldgs, and eqpt. (5 percent)	600	600	608	600	829	706	600	600	869
Income to labor	- 636	- 318	710	1,310	1,490	- 04	3,974	4,484	2,071
Interest on borrowed capital	---	313	243	347	319	150	171	190	116
Income to owned land, labor and capital	293	611	1,637	2,239	2,382	934	4,903	5,413	2,947
Return per day of labor	- 3.61-	2.50	6.23	10.56	7.60-	.02	20.07	22.76	10.90
Productive man day equivalents ^{8/}	(days) 176	(days) 127	(days) 114	(days) 124	(days) 196	(days) 196	(days) 198	(days) 197	(days) 190

1/ Limited to 60 sows.

2/ Limited to 40 sows and 280 fat hogs.

3/ Land, buildings and equipment considered as land.

4/ Adjusted to reflect capital turnover.

5/ Includes value of inventory change and value of home-consumed products.

6/ Machinery costs based upon operating costs and depreciation of owned equipment and custom rates when machine was not owned for a particular job. Other expenses as indicated in Table 20.

7/ \$3,764 needed for 6 months.

8/ University of Missouri Agricultural BF 5606, 1956, p. 8. Labor limited to 200 PMDE.

TABLE 25-PRESENT AND ALTERNATIVE FARM ORGANIZATIONS, INCOME, AND EXPENSES ON A PART-TIME FARM
IN EASTERN OZARKS OF MISSOURI 1953-57 PRICE RELATIONSHIPS

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Feeder pigs	Feeder pigs one litter fattened
	\$	\$	\$	\$	\$	\$
Capital investment						
Land and buildings <u>1/</u>						
Owned	6,100	6,100	6,100	6,100	6,617	6,343
Borrowed	3,900	3,900	4,194	4,068	3,383	3,657
New buildings & equipment (owned)	---	---	---	---	---	---
New buildings & equipment (borrowed)	---	---	---	---	---	---
Machinery, owned	2,202	2,202	2,202	2,202	2,202	2,202
Livestock, breeding						
Owned	1,805	2,400	---	2,400	800	650
Borrowed	---	---	---	---	---	---
Operating expenses <u>2/</u>						
Owned	1,414	819	3,219	819	1,902	2,326
Borrowed	---	756	3,617	1,077	---	---
Total capital						
Owned	11,521	11,521	11,521	11,521	11,521	11,521
Borrowed	3,900	4,656	7,811	5,145	3,383	3,657
Total	15,421	16,177	19,332	16,666	14,904	15,178
Land Use	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Corn for grain	7	7	---	3	7	7
Corn for silage	---	---	7	4	---	---
Hay and small grain	19	19	19	19	19	19
Cropland pasture	59	59	59	59	59	59
Permanent pasture	---	---	---	---	---	---
Woodland and wasteland	---	---	---	---	---	---
Total	85	85	85	85	85	85
Livestock organization	No.	No.	No.	No.	No.	No.
Beef cows	15	16	---	---	---	---
Feeder calves, winter & graze	---	---	16	---	---	---
Feeder calves, winter	---	---	53	---	---	---

TABLE 25-CONTINUED

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Feeder pigs	Feeder pigs one litter fattened
Feeder yearlings, graze	---	---	---	---	16	16
Ewes	---	---	---	80	---	---
Dairy cows	1	---	---	---	---	---
Sows	6	---	---	---	16	13
Hogs	---	---	---	---	---	91
Laying hens	12	---	---	---	---	---
Receipts:						
Crops	183	907	217	760	400	400
Livestock	1,159	1,200	7,917	2,376	5,904	6,972
ACP payments	---	---	---	---	---	---
Total	1,342 ^{3/}	2,107	8,134	3,136	6,304	7,372
Expenses						
Crops ^{4/}	772	936	1,056	1,005	936	936
Livestock	519	516	5,657	768	2,744	3,592
Other	123	123	123	123	123	123
Total	1,414	1,575	6,836	1,896	3,803	4,651
Income to land, labor capital	- 72	532	1,298	1,240	2,501	2,721
Interest on operating capital (6 percent)	325	371	369 ^{5/}	390	294	311
Income to land and labor	- 397	161	929	850	2,207	2,410
Interest on land, bldgs. and eqpt. (5 percent)	500	500	515	508	500	500
Income to labor	- 897	- 339	414	342	1,707	1,910
Interest on borrowed capital	195	240	319	268	169	183
Income to owned land, labor and capital	- 267	292	979	972	2,332	2,538
Return per day of labor	- 9.97 (days)	6.05 (days)	5.31 (days)	5.80 (days)	19.85 (days)	21.46 (days)
Productive man day equivalents ^{6/}	90	56	78	59	86	89

^{1/} Land, buildings and equipment considered as land.

^{2/} Adjusted to reflect capital turnover.

^{3/} Includes value of inventory change & value of home consumed products.

^{4/} Machinery costs based upon operating costs and depreciation of owned equipment and the custom rates when machine was not owned for a particular job.

^{5/} \$5,792 needed for 6 months.

^{6/} Derived from University of Missouri Agricultural BF 5606, 1956, p. 8. Labor was limited to 90 PMDE.

The alternative organizations available to this operator were rather limited, and some of them were not very promising. One of poor prospects was a beef cow-calf enterprise (Table 25). Even if he were able to attain rather efficient levels of production, he would lose the equivalent of \$6.05 for each day he worked on a beef cow-calf enterprise. But if calves were bought in the fall and the farm organization changed to a winter feeding operation, labor would be rewarded to the extent of \$5.31 a day. As was the case for farms in other economic classes, feeder pig production offered the best return. A plan that included 13 sows producing two litters annually, with one litter fattened and one sold as feeder pigs, and 16 yearlings kept only during the summer, would return \$2,538 to owned land, labor, and capital. After rewarding capital and land at current rates, labor would receive \$1,910 per year, or \$2.15 per hour. If the operator did not wish to raise feeder pigs, it seems that either a sheep enterprise or yearling steers wintered and grazed would be his best alternative enterprises.

Residential Farm

The operator of this 80-acre farm had enterprises that required about 37 days of labor in 1955. For this work, he received an income of \$100 to land, labor, and capital with 1953-57 prices. The livestock organization included 10 beef cows, which were efficiently handled, and 14 hens. He had 12 acres of hay and small grain and 48 acres in pasture. Twenty acres were used for timber. Except for a hay baler and combine, the operator had a full set of new farm machinery, the depreciation on which amounted to \$277 a year. If he had rewarded the capital he had invested and paid labor at current rates of return, he would have lost \$7.76 for each day he worked at farming.

His wife operated a baby apparel shop in one of the small towns and made about \$1,500 a year. Both the operator, who was 63, and his wife, who was 49, indicated that their health was good. When the operator was questioned about another job, he indicated that he did not desire an off-farm job. In budgeting the alternative farm enterprises, however, it was assumed that the operator would be able and willing to do at least 150 days of labor on the farm. The following additional conditions were assumed:

1. That he would not sell his farm machinery but would operate it himself, even though the depreciation charge would be greater than his return from his crops.
2. That a dairy enterprise would be too small to operate efficiently.

With these restrictions, it seems that the farm income would be increased very little by shifting to enterprises that would utilize the grazing land (Table 26). In fact, for any of these enterprises, the operator could not reward labor and earn the depreciation on his farm equipment. To reward labor, he would need to shift to an enterprise that used more labor. But with these enterprises, he would be confronted by capital limitations.

If he adopted a laying hen or broiler enterprise, he would be better off to let his grazing land lie idle and expand the poultry enterprises with his limited

TABLE 26-PRESENT AND ALTERNATIVE FARM ORGANIZATIONS, INCOME, AND EXPENSES ON A RESIDENTIAL FARM IN EASTERN OZARKS OF MISSOURI, 1953-57 PRICE RELATIONSHIPS

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Feeder pigs	Feeder pigs one litter fattened	Laying hens	Broilers
	\$	\$	\$	\$	\$	\$	\$	\$
Capital investment								
Land and buildings and equipment <u>1/</u>								
Owned	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Borrowed	---	---	---	---	---	---	---	---
New buildings and equipment (owned)	---	---	---	---	---	---	1,437	1,437
New buildings and equipment (borrowed)	---	---	---	---	---	---	3,405	3,313
Machinery, owned	850	850	850	850	850	850	850	850
Livestock, breeding								
Owned	886	1,437	---	1,437	1,437	1,250	---	---
Borrowed	---	63	---	63	163	---	---	---
Operating expenses <u>2/</u>								
Owned	551	---	1,437	---	---	187	---	---
Borrowed	---	1,032	156	1,190	2,699	3,331	---	---
Total capital investment								
Owned	7,287	7,287	7,287	7,287	7,287	7,287	7,287	7,287
Borrowed <u>3/</u>	---	1,095	156	1,253	2,862	3,331	3,405	3,313
Total	7,287	8,382	7,443	8,540	10,149	10,618	10,692	10,600
Land Use	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Corn for grain	---	---	---	---	---	---	---	---
Corn for silage	---	---	---	---	---	---	---	---
Hay and small grain	12	12	12	12	12	12	12	12
Cropland pasture	48	48	48	48	48	48	48	48
Permanent pasture	---	---	---	---	---	---	---	---
Woodland and wasteland	20	20	20	20	20	20	20	20
Total	80	80	80	80	80	80	80	80
Livestock organization	No.	No.	No.	No.	No.	No.	No.	No.
Beef cows	10	10	---	---	---	---	---	---
Feeder calves, winter & graze	---	---	10	---	---	---	---	---
Feeder calves, winter	---	---	---	---	---	---	---	---
Feeder yearlings, graze	---	---	---	---	10	10	---	---
Ewes	---	---	---	50	---	---	---	---
Dairy cows	---	---	---	---	---	---	---	---
Sows	---	---	---	---	32	25	---	---

TABLE 26-CONTINUED

Item	Organization and practice in 1955	Beef cow and calf	Feeder yearlings graze and winter	Sheep	Feeder pigs	Feeder pigs one litter fattened	Laying hens	Broilers
Hogs	---	---	---	---	---	168	---	---
Laying hens	14	---	---	---	---	---	900	---
Broilers	---	---	---	---	---	---	---	20,000
	\$	\$	\$	\$	\$	\$	\$	\$
Receipts								
Crops	235	234	370	131	252	252	252	584
Livestock	416	750	1,329	1,485	8,884	10,647	6,071	1,176
ACP payments	---	---	---	---	---	---	---	---
Total	651 ^{5/}	984	1,699	1,616	9,136	10,899	6,323	1,760
Expenses								
Crops ^{6/}	401	620	620	620	620	620	620	620
Livestock	60	322	883	480	4,689	6,327	4,005	383
Other	90	90	90	90	90	90	90	90
Total	551	1,032	1,593	1,190	5,399	7,037	4,715	1,093
Income to land, labor, and capital	100	-48	106	426	3,737	3,862	1,608	667
Interest on operating capital (6 percent)	137	203	147	212	309	337	51	51
Income to land and labor	- 37	- 251	- 41	214	3,428	3,525	1,557	616
Interest on land, bldgs. & eqpt. (5 percent)	250	250	250	250	250	250	492	488
Income to labor	- 287	- 501	- 291	- 36	3,178	3,275	1,065	128
Interest on borrowed capital (6 percent)	---	66	9	75	172	200	170	166
Income to owned land, labor, and capital	100	- 114	97	351	3,565	3,662	1,438	501
Return per day of labor	- 7.76	- 15.18	- 18.19	- 1.13	21.33	22.13	7.50	1.51
	(days)	(days)	(days)	(days)	(days)	(days)	(days)	(days)
Productive man day equivalents ^{7/}	37	33	16	32	149	148	142	85

^{1/} Land, buildings and equipment considered as land.

^{2/} Adjusted to reflect capital turnover.

^{3/} Borrowed capital limited to \$3,744.

^{4/} Capital limitation made grazing impractical.

^{5/} Includes value of inventory change and value of home-consumed products.

^{6/} Machinery costs based upon operating costs and depreciation of owned equipment and the custom rates when machine was not owned for a particular job. Other expenses limited as indicated in Table 20.

^{7/} Derived from University of Missouri Agricultural Extension BF 5606, 1956, p. 8. Labor limited to 150 PMDE.

capital. Neither of these enterprises, however, would have given him a return of \$2,000 to land, labor, and owned capital.

If feeder pigs were combined with yearlings grazed during the summer, the income to land, labor, and owned capital would be above \$3,500. Either of the two types of feeder pig enterprises would bring favorable returns.

Summary of Relative Incomes

Opportunities to earn income differ for different farmers because of variation in the factors they control. With the assumed level of management and price-cost relationships, the net return to land, labor, and capital after paying interest on borrowed capital, would be increased most for each of the typical farms by shifting to production of feeder pigs (Table 27). Producing eggs or broilers would be the next best opportunity. Producing Grade A milk was next in line if cows that would produce 8,000 pounds or more of milk were kept.

Prices of cattle, hogs, milk, and poultry products vary from year to year. The variations among products differ in direction and magnitude. Hence the relationships among prices vary, sometimes even more than the prices of individual products. In 1959, for example, prices of hogs, milk, and corn were lower and prices of cattle higher than in 1953-57. Thus, at 1959 prices, the advantage of a hog type of farming over other types of farming would not have been as great as shown in the foregoing analyses. But even at 1959 prices—when hogs were at the bottom of a price cycle—the relative positions of the alternative types of farming would not differ. The alternative types of farms studied would be more profitable with the improved practices assumed than those used in 1955 on representative farms.

The enterprises that use land and labor in less intensive ways provided far less net income than the intensive enterprises. Wintering and grazing of beef calves provided the best opportunity of any extensive enterprise to increase income on the Class II and III farms studied. Sheep offered the best enterprise on other classes of farms. On all farms studied, some enterprises and practices could be used that would increase the net income to more than double the 1955 level. Farm businesses that had high value of sales in 1955 offered greater opportunity to use several alternative enterprises. However, the greatest relative gains in net income could be attained by farmers who controlled limited amounts of resources.

TABLE 27-POTENTIAL NET INCOME TO OWNED LAND, LABOR, AND CAPITAL ^{1/} ON A TYPICAL FARM FROM EACH ECONOMIC CLASS IN THE EASTERN OZARKS OF MISSOURI, 1953-57 PRICE RELATIONSHIPS

Item	Economic Class						Part-time	Residential
	II	III	IV	V	VI			
Size of farm (acres)	110	260	320	640	411	85	80	
Owned capital (dollars)	15,183	38,680	16,552	17,060	17,483	11,521	7,287	
Labor potential (man work days)	365	300	300	300	200	90	150	
Net income to type of farm organization	\$	\$	\$	\$	\$	\$	\$	
Organization in 1955	3,355	3,414	1,533	754	293	-267	100	
Beef cow & feeder calf	1,135	2,976	992	1,131	611	292	-114	
Feeder yearlings (graze & winter)	2,109	4,370	1,608	2,220	1,637	979	97	
Sheep	1,889	3,810	2,203	2,342	2,239	972	351	
Grade A Dairy, 8,000 pounds of milk per cow	2,694	5,087	3,610	3,693	2,382	-3/	-3/	
Grade C Dairy, 8,000 pounds of milk per cow	1,295	3,188	1,281	1,453	934	-3/	-3/	
Feeder pigs & yearlings, grazed	8,086	7,962	8,033	7,455	4,903	2,332	3,565	
Feeder pigs								
1 litter fattened & yearlings grazed	7,530	9,306	7,480	7,667	5,413	2,538	3,662	
Laying hens and yearlings grazed	3,688	5,762	4,336	4,187	2,947	-3/	1,438	
Broilers and yearlings grazed	3,762	5,501	2,754	3,325	2,701	-3/	501	

1/ Borrowed capital had been rewarded at current rate in the area.

2/ Limitation on expansion of enterprise.

- a. Carrying capacity of pasture limited to what was carried in 1955.
- b. Capital borrowed limited to 52 percent of the value of real estate and 50 percent of the value of other assets.
- c. Labor requirements limited to those indicated above.
- d. Cropland use limited to present use of land—efficiency increased to optimum yields of most efficient producers.
- e. Cropland farmed in all situations.
- f. Grazing land used for grazing unless capital limitation made its use impractical.

3/ Limitations do not permit use of resource at scale that is profitable.

RESOURCES NEEDED FOR A GIVEN LEVEL OF INCOME

One characteristic of grazing land in the Eastern Ozarks is the small return per acre. Large acreages are required to yield enough income to support a family. The labor requirement per unit of livestock, except dairy cows, is small. A farmer can handle a large number of animals. Hence, the investment needed to keep a family labor force fully employed is large. If the various classes of land were present on each farm in the same proportion as on the average farm in the area, and if improved production practices were adopted, a capital investment of \$38,000 would be needed for a beef cow-calf farm, \$31,000 for a feeder yearling farm, \$15,000 for a Grade A dairy farm, and \$20,000 for a sheep farm, to provide a net return of \$2,000 to the operator's land, labor, and capital (Table 28). None of these units would be large enough to keep the operator fully employed. To provide full employment (300 days a year), an investment of about \$61,000 in a beef cow-feeder calf business, \$75,000 in a feeder yearling farm, \$42,000 in a Grade A dairy farm, and \$69,000 in a sheep farm would be required.

Some insight into the cash family income needed in the area is provided by data on expenditures of 180 families for family living in the Ozark Hill Area which were obtained by the Agricultural Extension Service for the years 1955-57 (Table 29). These families spent an average of \$1,987 for family living. Although the cash expenditures of the families from whom these records were obtained may have been higher than those of most families in the area, it seems probable most families would need \$2,000.

An analysis of the household incomes of farmers in the area in 1955 showed that the average net income to land, labor, and capital was \$658. To obtain a net return of \$2,000 to these factors with a beef cow-feeder calf type of farming on all farms in the area, the number of farms would need to be reduced from 10,560 to 2,738 (Table 30). Number of farms would have to be reduced to 3,160 for feeder yearlings, 8,060 for dairy cows, and 4,661 for sheep to achieve this net. If the net income per farm were more than \$2,000, the numbers of farms would have to be even smaller.

These results are based on the premise that the farm organization would be directed toward the use of the grazing resource. If, however, such livestock enterprises as hogs or poultry were expanded, the number of farms in the area would be limited only by marketing outlets. The capital investment needed to provide a net return of \$2,000 to land, labor, and capital would be about \$4,000 for feeder pigs, \$11,000 for a laying flock, and \$13,000 for a broiler flock. Most of the feed for these enterprises would be moved into the area.

TABLE 28-CHARACTERISTICS OF A FARM UNIT NEEDED TO RETURN
SELECTED NET INCOME TO LAND, LABOR, AND CAPITAL BY TYPE
OF FARMING IN THE EASTERN OZARKS OF MISSOURI,
1953-1957 PRICES 1/

Item	Type of Farm			
	Beef cow-calf	Feeder yearlings	Dairy-grade A 8,000 pounds of milk per cow	Sheep
Net return of \$2,000 to land, labor & capital				
Size of farm (acres)	674	584	229	396
Cropland harvested (acres)	97	84	33	57
Livestock (numbers)	35	30	12	105
Investment				
Real estate (dollars) <u>2/</u>	20,064	17,328	6,885	11,856
Nonreal estate (dollars) <u>3/</u>	18,131	13,785	8,335	8,374
Total (dollars)	38,195	31,113	15,220	20,230
Labor requirement - PWE (days) <u>4/</u>	168	97	120 <u>5/</u>	53
Net return of \$3,000 to land, labor, capital				
Size of farm (acres)	855	744	341	591
Cropland harvested (acres)	123	107	49	85
Livestock (numbers)	44	39	18	155
Investment				
Real estate (dollars) <u>2/</u>	25,384	22,192	10,251	17,632
Nonreal estate (dollars) <u>3/</u>	20,393	15,053	13,438	20,086
Total (dollars)	45,777	37,245	23,689	37,718
Labor requirement - PWE (days) <u>4/</u>	212	125	180 <u>5/</u>	145
Net return of \$4,000 to land, labor, capital				
Size of farm (acres)	1,035	903	452	716
Cropland harvested (acres)	149	130	65	103
Livestock (numbers)	54	47	23	185
Investment:				
Real estate (dollars) <u>2/</u>	30,856	26,904	13,464	21,280
Nonreal estate (dollars) <u>3/</u>	22,848	16,228	17,268	21,887
Total (dollars)	53,704	43,132	30,732	43,167
Labor requirement - PWE (days) <u>4/</u>	258	151	230 <u>5/</u>	174

1/ Farm acreage assumed to be distributed among the various classes of land according to the average farm holding indicated in 1954 Census.

2/ Does not include buildings and equipment.

3/ Includes cost of buildings, livestock, equipment, machinery and operating expenses. Machinery value are estimated at half the original cost.

4/ Operator assumed to be working with average efficiency and average equipment on a medium-sized farm.

5/ Cropland not large enough to justify ownership of farm machinery. Work on all crops custom hired.

TABLE 29-CASH COST OF FAMILY LIVING OF SOME FARMERS IN THE OZARK HILL AREA OF MISSOURI FOR THE YEARS 1955-1957 1/

Item	Number of Persons in Family					All Families
	2	3	4	5	6 or more	
Number of Families Sampled	43	31	41	34	31	180
	\$	\$	\$	\$	\$	\$
Food	466	545	613	538	633	553
Clothing	113	215	226	220	254	201
Household operation	173	207	211	233	223	207
Household equipment furnishings	394	303	317	302	232	349
Health	171	112	233	138	163	163
Education	24	96	85	116	83	75
Church contributions	102	108	134	100	85	104
Recreation	38	48	53	52	44	44
Personal	91	96	80	97	142	97
Transportation	161	227	198	217	178	194
Total cash cost of living	1,733	1,957	2,150	2,013	2,037	1,987

Item	Number of Persons in Family					All Families
	2	3	4	5	6 or more	
	Distribution of Family Living Cost					
	%	%	%	%	%	%
Food	27	28	29	27	31	28
Clothing	7	11	10	11	13	10
Household operations	10	11	10	11	11	10
Household equipment furnishings	23	15	15	15	11	18
Health	10	6	11	7	8	8
Education	1	5	4	6	4	4
Church contributions	6	5	6	5	4	5
Recreation	2	2	2	2	2	2
Personal	5	5	4	5	7	5
Transportation	9	12	9	11	9	10
Total distribution	100	100	100	100	100	100

1/ Source: Derived from unpublished reports of University of Missouri Agricultural Extension Service.

TABLE 30-NUMBER OF FARMS IN THE AREA THAT THE LAND RESOURCE WOULD SUPPORT AT VARIOUS LEVELS OF NET INCOME TO LAND, LABOR, AND CAPITAL FOR AN EXTENSIVE TYPE OF ENTERPRISE SUCH AS BEEF COW-CALF: CALF, DAIRY, AND EWE-LAMB ENTERPRISES, ASSUMING 1953-57 PRICING RELATIONSHIPS PREVAILED IN THE EASTERN OZARKS OF MISSOURI

Item	Types of Farms			
	Beef cow-calf No.	Feeder yearlings No.	Dairy-grade A 8,000 pounds of milk per cow No.	Sheep No.
Returns to land, labor capital				
\$2,000	2,738	3,160	8,060	4,661
\$3,000	2,159	2,481	5,412	3,123
\$4,000	1,783	2,044	4,083	2,578