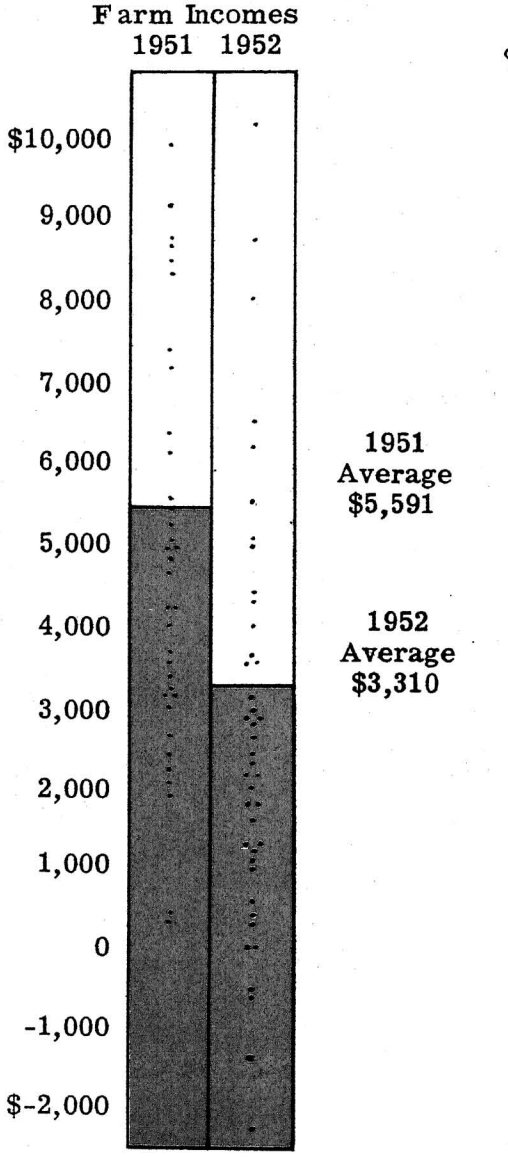
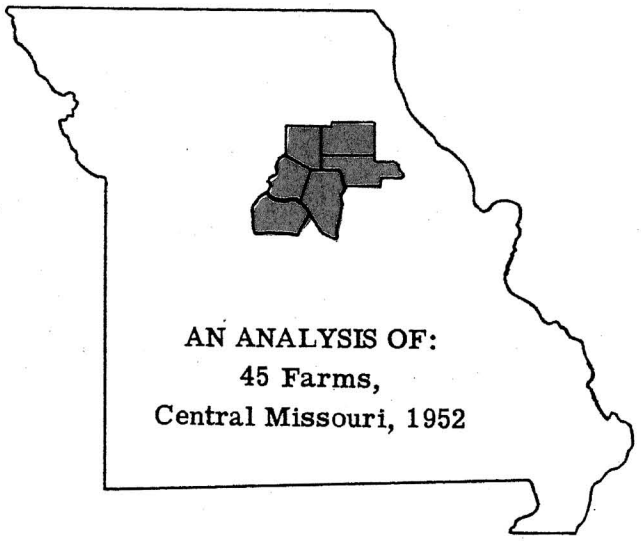
LET'S STUDY YOUR FARM BUSINESS





AN ANALYSIS OF:
45 Farms,
Central Missouri, 1952

	Average All Farms	Your Farm
Total farm acres	334	
Total farm capital	$38,329	$_____
Man work units	365	_____
Litters of pigs	16	_____
Beef cows	19	_____
Bu. corn per acre	56	_____
Bu. soybeans per acre	20	_____
Pigs per litter	7	_____
Percent calf crop	93	_____
Work units per man	270	_____
FARM INCOME	$ 3,310	$_____

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Agricultural Experiment Station

BULLETIN 603 *J. H. LONGWELL, DIRECTOR* *MAY, 1953*

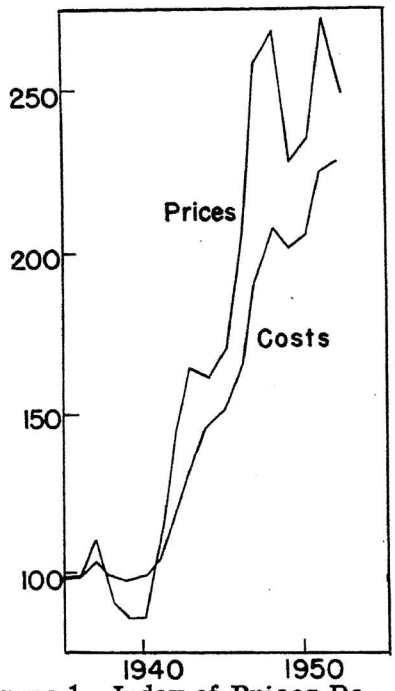

Figure 1--Index of Prices Received by Missouri Farmers, and Index U. S. Farm Costs.

PRICE CHANGES IN 1951 AND 1952

Prices in 1952 were less favorable to farmers than they were in 1951. The general price level dropped from 223 in 1951 to 214 in 1952 (1935-39 = 100). When the general price level declines, farm prices react more quickly than do other prices. For example, the Index of Prices received by Missouri Farmers declined from 273 in 1951 to 247 in 1952 (Figure 1). The Index of Farm Costs, however, continued to rise--from 225 in 1951 to 228 in 1952. Hence, 1952 was the beginning of a cost price squeeze in agriculture.

Beef cattle, hogs, and corn were the most important products farmers in this area had to sell. In 1952, the average price received (by Missouri Farmers) for beef cattle declined sharply (ave. price in 1951, $29.83; Jan. 1952, $28.20; Dec. 1952, $20.00) (Figure 2). The average price received for hogs was slightly lower in 1952 compared to 1951 (ave. price in 1951, $20.28; 1952, $18.32). The average price received for corn, however, remained high up until the 1952 crop was picked, at which time it declined rapidly (ave. price in 1951, $1.66; ave. Jan.-Sept. 1952, $1.82; Oct.-Dec. 1952, $1.47).

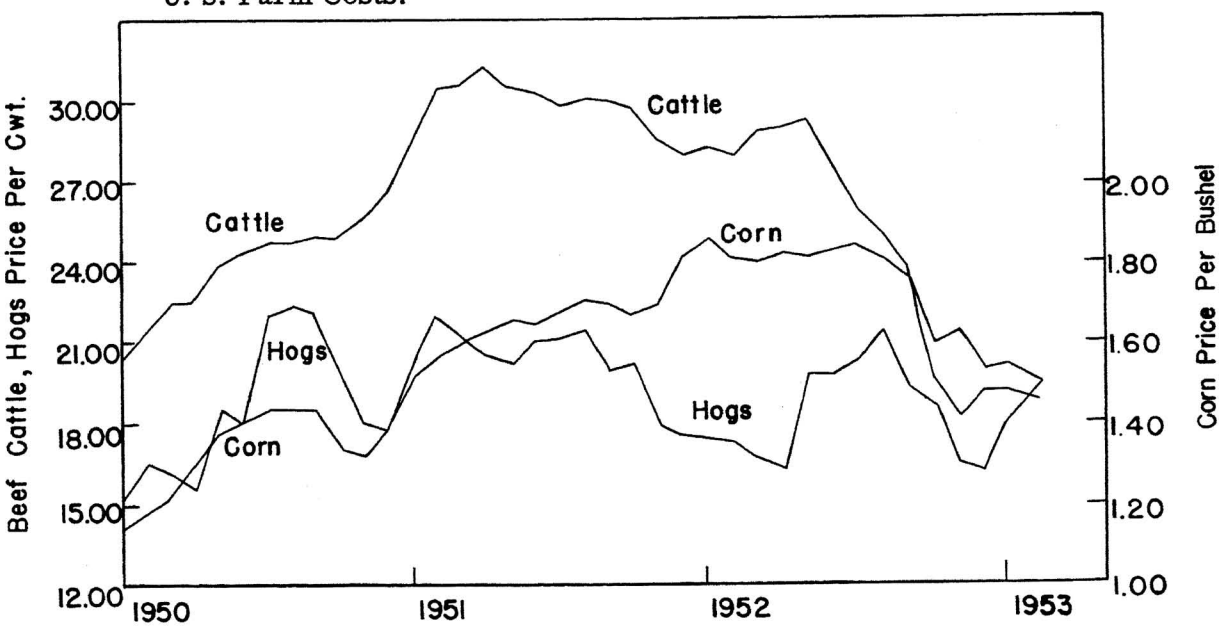

Figure 2--Changes in the Prices Received by Missouri Farmers for Beef Cattle, Hogs, and Corn. From January 1950 to date.
Source: Agricultural Prices, B. A. E., U. S. D. A.

LET'S STUDY YOUR FARM BUSINESS

AN ANALYSIS OF

45 Farms, Central Missouri, 1952

James E. Dillion and Robert C. Suter[1/]

A farm in order to be a business success must:

1. pay all operating expenses,
2. pay the prevailing rate of interest of all capital invested,
3. maintain its productivity, and
4. pay "wages" to the farm operator for his labor and management.

In other words, a farm is just like any other business in that it must make a reasonable return to all four factors of production--land, labor, capital, and management. If it does not, then there is need for an analysis of the farming operations, and for changes in the organization of the business.

In 1951 and 1952 a number of farmers in Central Missouri kept a record of their inventories, all cash receipts and expenses, and thus made possible a study of their farming operations. A total of 82 of these records have been analyzed by the Department of Agricultural Economics. Some of the results are summarized in this publication.

CASH BALANCE is the amount of money available for family living, saving, income tax payments, and debt and interest payments.

FARM INCOME is what is left to pay for the farmer's labor and management, and for the use of all capital invested. Unpaid family labor and inventory adjustments are included in the calculation of this figure.

LABOR INCOME is what the farmer receives for his year's work after paying all farm expenses and interest on all capital invested. In addition he has the farm products used in the household.

PERCENT RETURN TO CAPITAL the farm income minus the value of the farmer's time, divided by the total capital investment (times 100).

TABLE 1 -- SELECTED ITEMS OF RECEIPTS, EXPENSES, AND INCOME
37 Farms, Central Missouri, 1951.
45 Farms, Central Missouri, 1952.

Item	Average All Farms 1951	1952
1. Total Farm Capital	$35,511	$38,329
2. Cash Receipts	13,731	13,104
3. Cash Expenses	11,189	10,923
4. Cash Balance (2 minus 3)	2,542	2,181
5. Unpaid Family Labor	214	211
6. Inventory Increase	3,263	1,340
7. Farm Income (4 minus 5 plus 6)	5,591	3,310
8. Interest on Average Capital	1,775	1,916
9. Value of Operator's Time*	1,644	1,788
10. Labor Income (7 minus 8)	3,816	1,394
11. Return to Capital (7 minus 9)	$ 3,947	$ 1,522
12. Percent Return to Capital	10.9%	2.7%

*This figure was obtained by taking the average farm wage rate paid hired men furnished with a house and adding 20 percent to it for managerial ability.

The factors affecting these income measures are:

PRICES
SIZE OF BUSINESS
CROP YIELDS
RATES OF LIVESTOCK PRODUCTION
LABOR EFFICIENCY
SELECTION AND COMBINATION OF ENTERPRISES
MARKETS AND MARKETING PRACTICES

1/ J. E. Dillion, Instructor, Agricultural Economics, and R. C. Suter, Ass't. Professor, Agricultural Economics. Acknowledgments are also due G. Eaton, D. Adams, and J. Brotemarkle, Fieldmen for the Project, and V. Crowley, J. N. Hagan, J. E. Harris, H. Keith, R. Kimmel, G. Mutti, B. D. Walker, and D. Wheatley, County Agricultural Agents in Audrain, Boone, Cooper, Howard, Monroe and Randolph counties.

THE MANAGERIAL ABILITY of the farmer is also important in obtaining a satisfactory cash balance, a high income, and better family living.

DESCRIPTION OF THE AREA

Location and climate: The farms from which the records were obtained were located in Audrain, Boone, Cooper, Howard, Monroe and Randolph counties.

The predominant soil type on the farms studied was Putnam silt loam along with an intermingling of Lindley loam. Also, on the farms in Howard County there was some Menfro silt loam. Generally speaking, there was considerable variation in the soil types within farms as well as among groups of farms or among areas.

A level topography is associated with the Putnam soil type and it was on this land that most of the soybeans were grown. In the Lindley soil type areas and in the river hill areas the topography is much more rolling. Again, there was considerable variation within farms as well as variation between them.

The average growing season in these counties is 180 days.[1/] The average annual rainfall is 37 inches with an average of 24 inches falling during the growing season. In 1952 the growing season was 175 days. The total rainfall was 33.8 inches with 22.5 inches falling during the months of April through September.

Type of Farming: A general livestock type-of-farming is found in this area. In 1952 approximately 75 percent of cash receipts came from the sale of livestock and livestock products (Table 2). Furthermore, 54 percent of the livestock receipts were from the sale of hogs (Table 4). Only one-fifth of the total came from crops.

TABLE 2 -- SOURCE OF FARM RECEIPTS
45 Farms, Central Missouri, 1952

Source	Amount	Percent
Crops	$ 2,680	20.5
Livestock and livestock products	9,855	75.2
Other	569	4.3
Total cash receipts	$13,104	100.0

The farms studied in 1952 averaged 334 total acres, with 165 acres of cropland and 119 of permanent pasture. Forty-five acres, 27 percent of all cropland were planted to corn; 28 acres were in wheat; 24 acres were in soybeans; and 16 acres were in oats (Table 3).

TABLE 3 -- LAND USE
45 Farms, Central Missouri, 1952.

Item	Acre	Percent
Corn	45	27
Oats	16	10
Wheat	28	17
Soybeans	24	15
Red clover	13	8
Alfalfa	2	1
Lespedeza	10	6
Other	27	16
Total acres cropland	(165)	(100)
Woods	27	
Pasture	119	
Farmsteads, roads, waste, etc.	23	
Total farm acres	(334)	

Forty-four of the farms kept an average of 19 beef cows; 44 farms raised an average of 16 litters of pigs; and 20 kept an average of 41 ewes (Table 5.)[2/]

Financial Summary, 1952; The financial summary on page 6 shows where the money came from, and where the money went. Sales of hogs ($5,285), beef cattle ($3,374), and crops ($2,680) were the three largest sources of cash. Beyond this, there was an increase in inventory ($1,340). Feed purchased ($2,593), livestock purchased ($1,649), vertilizer, lime, and rock phosphate ($1,471), and new machinery ($1,360) were the major items of outlay. The average Farm Income was $3,310; the average return to the operator for his labor and management (Labor Income) was $1,394.

The return to the operator (Labor Income) was used as the basis for sorting all farms into three groups--one with high incomes, one with medium incomes, and one with low incomes. The average return to all operators was $1,394; the average return to the operators of the 15 most pro-

1/ 1941 Yearbook of Agriculture: Climate and Man. U.S.D.A. 1941.

2/ Six farms, which were off-type, were excluded from this study. Four of these were dairy farms and two were intensive feeder cattle operations.

fitable farms was $4,467; the average return to the operators of the 15 least profitable farms was $-1,234. This shows a wide variation in profits in farming even among farmers who kept good records.

Comparison with 1951 Records: The scatter diagram on the cover shows the variation in Farm Income for both 1951 and 1952. The average income on farms where records were analyzed dropped from $5,591 in 1951 to $3,310 in 1952.[1/] The return to the operator for his labor and management dropped from $3,816 to $1,394 (page 1). Some of this decrease was due to price declines in hogs during the first part of 1952, and then, in beef cattle during the latter part of the year.

The average cash receipts and cash expenses were both down slightly in 1952. Cash receipts dropped from $13,731 to $13,104 whereas the cash expenses dropped from $11,189 to $10,923. The larger decrease in receipts relative to the decrease in expenditures led to a decline in the cash balance (from $2,542 in 1951 to $2,181 in 1952).

The inventory change (an increase of $1,340) in 1952 was also much less than the inventory change (an increase of $3,263) in 1951. In 1952 farmers were much more conservative about purchasing new machinery, and, secondly, lower livestock prices led to lower values on the feeder livestock enterprises.

Business Analysis: There are many reasons for the wide variation in farm incomes. Important among them are size of business, rates of crop and livestock production, and efficiency in the use of land, labor and capital equipment. A number of measures of each major farm business factor are listed on page 6. The average for each factor was obtained for all farms, and then, after sorting the farms on the basis of the rank of each factor, the averages for the high third and the low third groups were obtained.

[1/] Of the 37 records obtained in 1951 and the 45 records obtained in 1952, 31 were from the same farms.

TABLE 4 -- FINANCIAL SUMMARY
45 Farms, Central Missouri, 1952.

Item	Average All Farms	Your Farm	15 Most Profitable*	15 Least Profitable*
FARM RECEIPTS				
Dairy cattle	$ 108	$_____	$ 72	$ 115
Dairy products	138	_____	161	95
Beef cattle	3,374	_____	3,851	3,329
Sheep	343	_____	302	544
Wool	68	_____	63	104
Hogs	5,285	_____	6,961	4,361
Poultry	104	_____	74	58
Eggs	413	_____	297	391
Horses	22	_____	13	14
Crops	2,680	_____	3,556	2,351
Government payments	148	_____	136	152
Other receipts	421	_____	679	372
TOTAL CASH RECEIPTS	(13,104)	_____	(16,165)	(11,886)
FARM EXPENSES				
Labor	356	_____	465	283
Feed purchased	2,593	_____	2,423	2,521
Auto expense	140	_____	138	158
Truck expense	78	_____	71	127
Gas, oil, and grease	516	_____	621	558
Equipment repair	383	_____	478	414
New Machinery	1,360	_____	1,753	1,657
Machinery hire	385	_____	362	432
Fertilizer, lime, rock phosphate	1,471	_____	1,741	1,515
Crop expense	394	_____	487	426
Livestock expense	130	_____	138	177
Livestock purchased	1,649	_____	2,194	1,600
Building and fence upkeep	295	_____	229	322
New buildings and improvements	567	_____	641	931
Taxes	306	_____	345	299
Insurance	129	_____	185	127
Miscellaneous	171	_____	211	178
TOTAL CASH EXPENSES	(10,923)	_____	(12,482)	(11,725)
CASH BALANCE	2,181	_____	3,683	161
Unpaid family labor	211	_____	249	337
Change in inventory (total)	(1,340)	_____	(3,405)	(971)
Buildings and improvements	374	_____	387	620
Machinery and equipment	414	_____	637	739
Livestock	- 44	_____	612	- 262
Feed and supplies	596	_____	1,769	- 126
OPERATOR'S FARM INCOME	$ 3,310	$_____	$ 6,839	$ 795
Interest on average capital	1,916	_____	2,372	2,029
Value of operator's time	1,788		1,788	1,788
*RETURN TO OPERATOR'S LABOR AND MANAGEMENT	$ 1,394	$_____	$ 4,467	$-1,234
RETURN TO CAPITAL	1,522	_____	5,051	- 993
Percent return	2.7	_____	11.2	- 4.0

TABLE 5 -- FARM BUSINESS ANALYSIS
45 Farms, Central Missouri, 1952.

	Average All Farms	Your Farm	High Third	Low Third
SIZE OF FARM BUSINESS				
Total farm acres	334		511	188
Acres of cropland	165		250	93
Animal units	68		103	38
Capital Invested				
Land, buildings, improvements[1/]	$20,217		$35,879	$ 8,832
Livestock	9,034		11,923	6,700
Machinery and equipment	5,289		7,275	3,822
Feed and supplies	3,789		5,687	2,204
Total farm capital	$38,329		$60,764	$21,558
Productive man work units	365		507	248
Man equivalent	1.4		1.9	1.0
SIZE OF LIVESTOCK ENTERPRISE[2/]				
Number of dairy cows (29 farms)	2		4	1
Number of beef cows (44 farms)	19		30	8
Number of litters of pigs (44 farms)	16		29	6
Number of ewes (20 farms)	41		73	16
Number of laying hens (38 farms)	114		195	41
RATES OF LIVESTOCK PRODUCTION				
Percent calf crop	93		100	85
Pigs weaned per litter	7.2		8.3	6.2
Percent lamb crop	91		107	70
Eggs produced per hen	158		191	129
CROP YIELDS				
Corn, bu. per acre	55.9		69.4	42.5
Soybeans, bu. per acre	20.4		26.6	13.8
Wheat, bu. per acre	25.2		31.4	18.4
Oats, bu, per acre	23.2		32.4	14.9
Hay, tons per acre				
Alfalfa	2.4		(too few to calculate)	
Red clover	1.9		2.7	1.1
Lespedeza	1.1		1.6	0.7
MEASURES OF EFFICIENCY				
Returns per $100 feed fed				
Beef cattle	$ 122		$ 173	$ 74
Hogs	107		137	77
Sheep	105		(too few to calculate)	
Laying hens	113		152	73
All productive livestock	110		135	83
Animal units per man	50		73	31
Work units per man	270		362	190
Acres of cropland per man	125		187	76
Acres of cropland per tractor	134		196	83
Capital invested per man	$27,576		$40,465	$17,143
Invest. in mach. and equip:				
Per acre cropland	34		49	20
Per man	3,976		6,054	1,979
Per 100 work units	1,502		2,197	852
Dollars spent per acre cropland for all fertilizer	9.63		14.61	5.31

[1/] For all farms, the average value of land was $61.82 per acre. The value per acre for the high third was $97.60; the low third, $31.40. These are normal market values as estimated by the farm operators.

THE RELATIONSHIPS BETWEEN FARMING BUSINESS FACTORS AND PROFITS FROM FARMING

There is usually a wide variation among farms in volume of business, crop yields, rates of livestock production, selection and combination of enterprises, labor efficiency, and marketing practices. Furthermore, the variation in these major factors account for most of the variation in the returns to the farm operator for his labor and management (Labor Income).

Size of Business: The size of the farm or the volume of its business is closely related to the Operator's Labor Income. As volume of business increases, income usually increases, particularly if prices are favorable. This is true for either method of increasing the size of the business--whether more acres are added, or whether more intensive enterprises are used on a given acreage. It is also true no matter how the size of the farm or the volume of its business is measured.

In this study, total farm acres, acres of cropland, total farm capital, and total productive man work units were used as measures of size. Total farm acres is the more common measure of size of farm; however, the amount of productive work accomplished is a much better measure of the volume of its business. A strong relationship usually exists between either of these and the return to the farm operator for his labor and management.

In 1952, when the total farm acres increased from 188 to 511 the Operator's Labor Income increased from $494 to $2,167 (Table 6). When the acres of cropland increased from 93 to 250 the Operator's Labor Income increased from $-11 to $3,254 (Table 7).

When total farm capital (both the landlord's and the operator's) is used as a measure of size, a strong relationship between size and income is obtained. In this study, when the total farm capital increased from $21,558 to $60,764, the Operator's Labor Income increased from $693 to $2,468 (Table 8.) A fairly sizeable increase in total farm acres and acres of cropland was associated with the larger amounts of capital (total acres increased from 235 to 465, and acres of cropland increased from 127 to 227).

Total productive man work units is the best single measure of the volume of business.[1/] It is a measure of the actual amount of productive work accomplished. As the volume of business increased from 248 to 507 work units, the Operator's Labor Income increased from $504 to $2,983 (Table 9). One reason for this is that larger businesses usually make more efficient use of land, labor, capital, and management than do small businesses.

TABLE 6 -- RELATIONSHIP BETWEEN SIZE OF BUSINESS (MEASURED IN TERMS OF TOTAL FARM ACRES) AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Total Farm Acres Range	Total Farm Acres Average	Number of Farms	Operator's Labor Income
136 - 249	188	15	$ 494
250 - 349	304	15	1,521
350 - 865	511	15	2,167
All farms	334	45	$1,394

TABLE 7 -- RELATIONSHIP BETWEEN SIZE OF BUSINESS (MEASURED IN TERMS OF ACRES OF CROPLAND) AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Acres of Cropland Range	Acres of Cropland Average	Number of Farms	Operator's Labor Income
67 - 120	93	15	$ - 11
121 - 184	153	15	940
185 - 385	250	15	3,254
All farms	165	45	$1,394

TABLE 8 -- RELATIONSHIP BETWEEN SIZE OF BUSINESS (MEASURED IN TERMS OF TOTAL FARM CAPITAL) AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Total Farm Capital Range	Total Farm Capital Average	Number of Farms	Total Farm Acres	Acres of Cropland	Labor Income
$11,446 - $ 27,499	$21,558	15	235	127	$ 693
27,500 - 38,499	32,666	15	302	142	1,022
$38,500 - $126,105	60,764	15	465	227	2,468
All farms	$38,329	45	334	165	$1,394

[1/] A productive man work unit is the amount of work done by one man in a ten-hour day under average conditions. Hence, total work units represent the number of days which are required under average conditions to care for the acreage of crops grown and the number of livestock kept.

An increase in labor efficiency, measured in terms of work units per man, is usually associated with increases in size. In this study, as the size of farm increased from 248 work units to 507, the labor efficiency jumped from 218 to 323 work units per man. Increasing size by increasing the amount of work accomplished per man also leads to increases in income.

TABLE 9 -- RELATIONSHIP BETWEEN SIZE OF BUSINESS (MEASURED IN TERMS OF PRODUCTIVE MAN WORK UNITS) AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Total Man Work Units		Number	Total Farm	Work Units	Operator's
Range	Average	of Farms	Capital	Per Man	Labor Income
174 - 298	248	15	$23,835	218	$ 504
299 - 388	338	15	37,249	270	696
389 - 866	507	15	53,904	323	2,983
All farms	365	45	$38,329	270	$1,394

Crop Yields and Rates of Livestock Production: Similar to the increases in volume of business, increases in the crop yields and in the rates of livestock production also have a considerable influence on the returns to the operator. This is particularly true with the more important enterprises--either the crops grown, or the livestock raised.

In this study the average corn yield was 56 bushels per acre. Yet, when the yield increased from 42 to 69 bushels per acre, the Operator's Labor Income increased from $440 to $2,167 (Table 10).

TABLE 10 -- RELATIONSHIP BETWEEN CORN YIELD AND LABOR INCOME
44 Farms, Central Missouri, 1952.

Corn Yield, Bushels Per Acre		Number	Average	Operator's
Range	Average	of Farms	Acreage of Corn	Labor Income
30.0 - 49.9	42.5	15	42.4	$ 440
50.0 - 59.9	52.2	14	49.7	1,632
60.0 - 85.9	69.4	15	46.5	2,167
All farms	55.9	44	45.1	$1,408

The same relationship was obtained using pigs per litter. When the number of pigs per litter increased from 6.2 to 8.3, the Operator's Labor Income increased from $381 to $1,694 (Table 11). The middle group (farms averaging 7.2 pigs per litter) in Table 11, however, had a Labor Income of $2,473. This relationship, like the previous relationships, (Table 6-10), is a multiple one--in this case, rates of livestock production combined with the size of the livestock enterprise. The middle group of farms in Table 11 raised an average of 29 litters of pigs, whereas the bottom group (those averaging 6.2 pigs per litter) had only 15 litters. Hence, the size of the hog enterprise was the reason for the higher income of the middle group. If the size of the hog enterprise were held constant, there would still exist a strong relationship between the number of pigs per litter and the returns to the operator for his labor and management. However, a sufficient volume of business as well as high rates of livestock production are necessary for high incomes.

TABLE 11 -- RELATIONSHIP BETWEEN PIGS PER LITTER AND LABOR INCOME
38 Farms, Central Missouri, 1952.

Pigs Per Litter		Number	Average Number	Operator's
Range	Average	of Farms	of Litters of Pigs	Labor Income
4.8 - 6.7	6.2	13	12	$ 381
6.8 - 7.6	7.2	12	29	2,473
7.6 - 9.2	8.3	13	15	1,694
All farms	7.2	38	18	$1,491

The Combination of the Productive Agents: Attempts are often made to show the relationships that exist between certain combinations of the productive agents and returns to the operator. Two of these--that relationship between the investment in machinery and equipment per man and labor income, and the relationship between the machinery investment per acre of cropland and labor income--are presented here.

When more capital is added to a given amount of labor, the returns from the business usually increase. On these farms, there was an average of $27,576 invested per man (page 6). Of this, $3,976 was invested in machinery and equipment. When the investment in machinery and equipment per man was increased from $1,979 to $6,054 the Operator's Labor Income increased from $784 to $2,338 (Table 12).

When the capital invested in machinery and equipment was divided by the acres of cropland, however, the opposite relationship occurred. As the investment (in machinery and equipment) per acre of cropland increased from $20.01 to $49.43 the Operator's Labor Income dropped from $1,911 to $911 (Table 13).

In other words, labor is the scarce factor on farms in the United States. Capital is added to labor in order to increase labor productivity. The amount of productive work accomplished per man is actually what counts (see next section). While this is true in the United States it would not necessarily be true in those countries where land is the scarce factor and labor is more plentiful.

Labor Efficiency: A wide variation is usually found in the amount of productive work accomplished per man. This is true no matter how it is measured--in terms of acres of cropland cared for per man, number of animals cared for per man, or number of man work units accomplished per man.

TABLE 12 -- RELATIONSHIP BETWEEN THE INVESTMENT IN MACHINERY AND EQUIPMENT PER MAN AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Investment in Machinery and Equipment per Man		Number	Operator's
Range	Average	of Farms	Labor Income
$1,306 - $2,999	$1,979	15	$ 784
3,000 - 4,699	3,894	15	1,060
$4,700 - $8,700	6,054	15	2,338
All farms	$3,976	45	$1,394

TABLE 13 -- RELATIONSHIP BETWEEN THE INVESTMENT IN MACHINERY AND EQUIPMENT PER ACRE OF CROPLAND AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Investment in Machinery and Equipment per Acre Cropland		Number	Operator's
Range	Average	of Farms	Labor Income
$ 8.84 - $27.99	$20.01	15	$1,911
28.90 - 36.99	32.41	15	1,361
$37.00 - $76.27	49.43	15	911
All farms	$33.95	45	$1,394

In this study as the acres of cropland per man increased from 76 to 187 the Operator's Labor Income increased from $-136 to $2,427 (Table 14).

TABLE 14 -- RELATIONSHIP BETWEEN ACRES OF CROPLAND PER MAN AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Acres Cropland Per Man		Number	Total Acres	Operator's
Range	Average	of Farms	Cropland	Labor Income
34 - 99	76	15	107	$ -136
100 - 129	113	15	155	1,892
130 - 341	187	15	238	2,427
All farms	124	45	165	$1,394

As the number of animal units per man increased from 31 to 73 the Operator's Labor Income increased from $390 to $1,926 (Table 15). The middle group of farms, averaging 45 animal units per man, had a fairly high Labor Income (1,866) in relation to the other two groups. This is because one of the largest farms in the study "fell in" the middle group. Omitting this farm, the average Labor Income for the middle group would have been $1,323.

TABLE 15 -- RELATIONSHIP BETWEEN ANIMAL UNITS PER MAN AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Animal Units per Man		Number	Total	Operator's
Range	Average	of Farms	Animal Units	Labor Income
24 - 39	31	15	43	$ 390
40 - 52	45	15 (14)	66 (64)	1,866 ($1,323)
53 - 107	73	15	95	1,926
All farms	50	45	68	$1,394

Work units per man is probably the best over-all measure of labor efficiency. As work units per man increase the returns to the operator for his labor and management usually increase. One reason for this is that an increase in labor efficiency is usually closely associated with increases in the size of the farm business.

In this study, as the labor efficiency increased from 190 to 362 work units per man, the size of business increased from a total of 287 to 457 man work units, and the Operator's Labor Income increased from $118 to $2,429 (Table 16). If a farm operator desires a good income, his business should be large enough and the selection and combination of the various enterprises should be such that the labor force will be kept gainfully employed most of the time.

Feed efficiency: The over-all returns per $100 of feed fed is a measure of the feed efficiency of all productive livestock enterprises on the farm. Some enterprises, of course, are expected to have higher returns per $100 of feed fed than others, due to the relative importance of the various inputs, particularly feed and labor, that enter into the productive processes of each of the livestock enterprises.[1/] Hence, in making comparisons between farms in terms of the returns per $100 of feed fed to all productive livestock, one is sometimes comparing differences in the kinds of livestock kept, as well as differences in the efficiency of the feeding operations.

TABLE 16 -- RELATIONSHIP BETWEEN PRODUCTIVE MAN WORK UNITS PER MAN AND LABOR INCOME
45 Farms, Central Missouri, 1952.

Work Units Per Man		Number	Total Man	Operator's
Range	Average	of Farms	Work Units	Labor Income
148 - 229	190	15	287	$ 118
230 - 279	259	15	350	1,636
280 - 510	362	15	457	2,429
All farms	270	45	365	$1,394

Assuming, however, that a similar number of the same kinds of livestock are kept on these farms, the relationship between feed efficiency and returns to the operator may be studied. As the returns per $100 of feed fed increased from $83 to $135 in 1952 the Operator's Labor Income increased from $695 to $2,220 (Table 17). This relationship would be even more pronounced in a year when the livestock product-feed price ratios were more favorable than in 1952.

TABLE 17 -- RELATIONSHIP BETWEEN RETURNS PER $100 FEED FED ALL PRODUCTIVE LIVESTOCK AND LABOR INCOME
44 Farms, Central Missouri, 1952.

Return Per $100 Feed Fed		Number	Total	Operator's
Range	Average	of Farms	Animal Units	Labor Income
$ 0 - $104	$ 83	15	56	$ 695
105 - 119	113	14	64	860
$120 - $171	135	15	80	2,220
All farms	$110	44	68	$1,268

The Cumulative Effect: Individually each of the various farm business factors have a considerable influence on the returns to the farm operator. However, combined with each other, their influence becomes still greater. Table 18 shows the combined effect of size and efficiency on Labor Income. Moving across the table labor efficiency is held constant and increases in the volume of business lead to increases in Labor Income. Moving downward in each column size of business is held constant and increases in labor efficiency lead to increases in the Operator's Labor Income. Progressing diagonally downward and across the table the combined effect is shown. In 1952, the small inefficient farm business had a Labor Income of $-24; on the other hand, the large highly efficient business had a Labor Income of $3,711.

TABLE 18 -- RELATIONSHIP BETWEEN SIZE OF BUSINESS, LABOR EFFICIENCY, AND LABOR INCOME
Estimated Value,* 44 Farms, Central Missouri, 1952.

Labor Efficiency (Man Work Units Per Man)	Size of Business (Total Productive Man Work Units)			
	Small (174-284)	Medium-Small (285-329)	Medium-Large (330-409)	Large (410-866)
	--- Operator's Labor Income ---			
Low (148-215)	$ -24	$ 364	$ 731	$1,677
Medium-low (216-264)	279	730	1,156	2,254
Medium-high (265-299)	513	1,011	1,483	2,669
High (300-423)	$1,044	$1,652	$2,228	$3,711

* $X_4 = \$ - 1{,}602.69 + 2.651142\ (X_1) + 1.772642\ (X_2) + .015588\ (X_3)$
X_1 = Total Productive Man Work Units; X_2 = Man Work Units Per Man;
$X_3 = X_1X_2$ X_4 = Operator's Labor Income.

1/ The usual ranking of various livestock enterprises as to the returns per $100 feed fed, is: High, dairy and poultry; Medium-high, hogs; Medium-low, feeder cattle and sheep; Low, beef cow herds.

Those farmers who are above average in several factors affecting profits usually have a much higher income than those who are above average in only a few. In this study those farmers who excelled in 4 or 5 factors had Labor Incomes which were considerably above those obtained by other farmers (Table 19). In other words, being above the average of the group in several of the factors that influence income has a cumulative effect.

TABLE 19 -- RELATIONSHIP BETWEEN THE NUMBER OF FARM MANAGEMENT FACTORS ABOVE AVERAGE AND LABOR INCOME*
45 Farms, Central Missouri, 1952.

Number of Factors in which Farmer Excelled	Number of Farms	Operator's Labor Income
0 or 1	17	$ 270
2 or 3	15	566
4	8	3,319
5	5	4,620
All farms	45	$1,394

*The factors used were (1) Total Man Work Units, (2) Bushels of Corn per Acre, (3) Pigs Per Litter, (4) Animal Units Per Man, and (5) Work Units Per Man.