GUIDES TO FINANCING THE FARM BUSINESS

Thesis for the Degree of M. S.
MICHIGAN STATE COLLEGE

Carl Henry Moore

1946

THESIS

This is to certify that the

thesis entitled

Guides To Financing a Farm Business

presented by

Carl Henry Moore

has been accepted towards fulfillment
of the requirements for

M. S. degree in **Farm Management**

E. B. Kiel

Major professor

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GUIDES TO FINANCING THE FARM BUSINESS

By

Carl Henry Moore

A THESIS

Submitted to the Graduate School of Michigan State College of Agriculture and Applied Science in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE

Department of Farm Management

1946

VITA

Carl Henry Moore

PERSONAL

Age: 30 years
Birthplace: Branch county, Michigan
Nationality: American
Marital status: married

Religion: Protestant
Height: 6 ft. 2 in.
Weight: 165
Health: Excellent

EDUCATION

Quincy high school; graduated 1934
Michigan State College; Bachelor of Science degree in agriculture.
Major: Animal Husbandry.

COLLEGE ACTIVITIES

President of Agricultural Council, Master of Student Grange, member of Block and Bridle and Campus 4-H clubs.

AFFILIATION

Farmhouse fraternity and Alpha Zeta honorary fraternity.

PRACTICAL TRAINING AND EXPERIENCE

Born and raised on a general livestock farm in Branch county, Michigan.

Member of 4-H club for nine years with projects in sheep, swine, dairy, and handicraft.

Assistant county agricultural agent in Midland county, Michigan, for seven months; August 1939 to March 1940.

Assistant county agricultural agent in Genesee county, Michigan, for seven months in charge of the Land Use Planning Study for the county; March 1940 to October 1940.

District 4-H club agent in southwestern Michigan for nine months; October 1940 to July 1941.

Four and one-half years with U. S. Army; eighteen months in European Theater of Operations as Aerial Navigator with a medium bombardment group. Rank: Captain.

Agricultural Supervisor for radio station WKAR, Michigan State College, East Lansing, Michigan, for eight months; January 1946 to September 1946.

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The information on beef cattle was prepared with the assistance of Dr. George A. Branaman of the Animal Husbandry Department, Michigan State College. Mr. A. C. Baltzer, Extension Specialist in dairy, assisted the author in the preparation of material on the dairy enterprise.

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CONTENTS

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INTRODUCTION

The purpose of this study is to present information, based in so far as possible on actual records, that will be of value to bankers and others in - - - -

1. Properly and quickly "sizing-up" a farm business
2. Helping farmers build a sound financial program
3. Making farm loans

This study is primarily concerned with production loans although some consideration will be given to the calculation of long time earning capacity of a farm.

Because of the wide variations in agriculture from one area to another and the time available for this study it has been necessary to limit this report to the general farming area of south-central Michigan.* Much of the information presented will be applicable to other areas, but care should be exercised in using it outside of this general farming area where dairying and other intensive farm enterprises predominate.

This report offers a procedure to follow that should enable a banker or any other person, who knows something about farming and is acquainted with his community, to estimate the income possibilities of a given farm. Many bankers are doing this now. They base their estimates on experiences and are doing a commendable job. But for those who are

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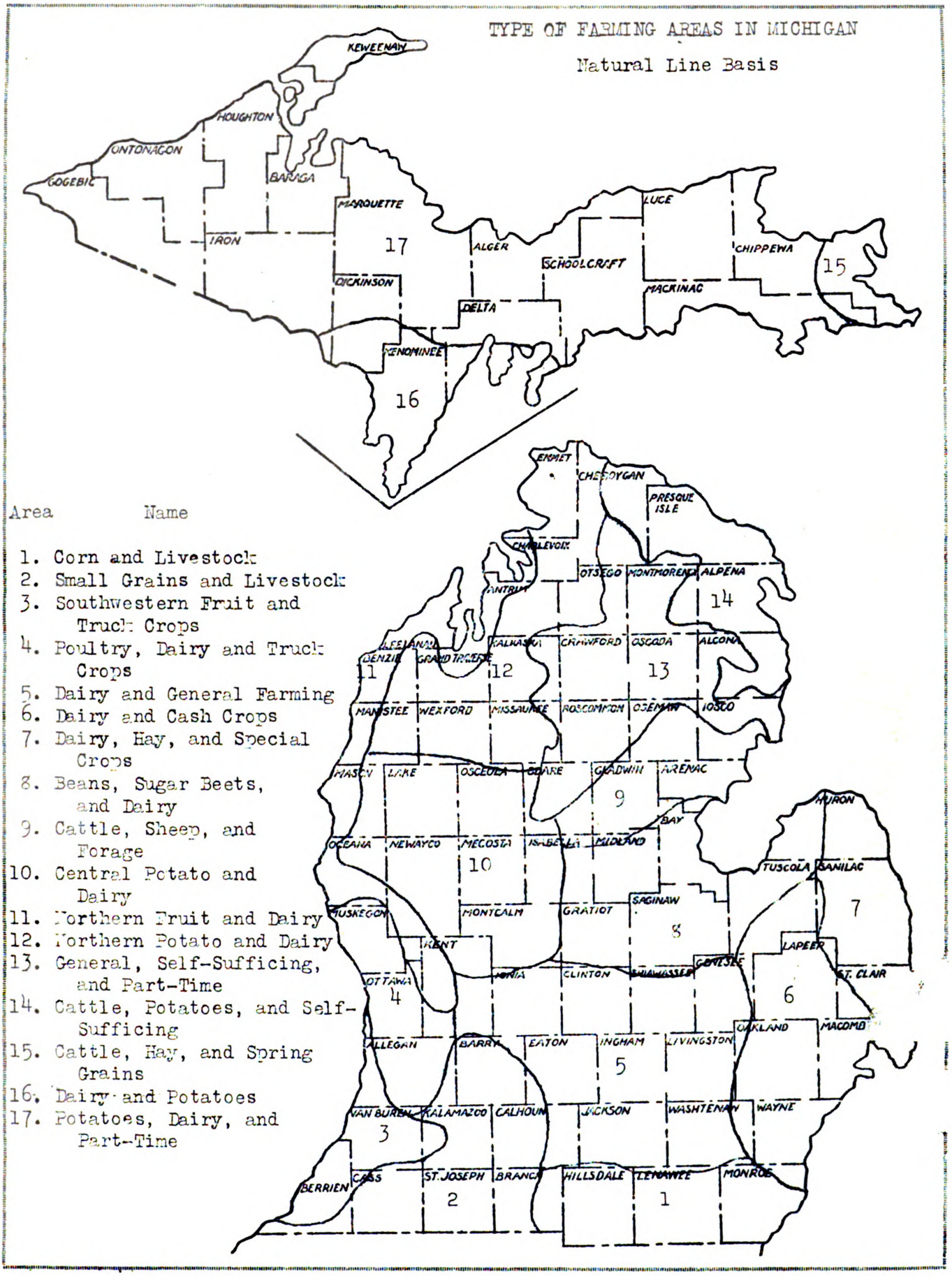
* See Figure 1 for location and description of the type of farming area on which this study is based.



Area Name

1. Corn and Livestock
2. Small Grains and Livestock
3. Southwestern Fruit and Truck Crops
4. Poultry, Dairy and Truck Crops
5. Dairy and General Farming
6. Dairy and Cash Crops
7. Dairy, Hay, and Special Crops
8. Beans, Sugar Beets, and Dairy
9. Cattle, Sheep, and Forage
10. Central Potato and Dairy
11. Northern Fruit and Dairy
12. Northern Potato and Dairy
13. General, Self-Sufficing, and Part-Time
14. Cattle, Potatoes, and Self-Sufficing
15. Cattle, Hay, and Spring Grains
16. Dairy and Potatoes
17. Potatoes, Dairy, and Part-Time

Figure 1 - Type of Farming Area in Michigan

less experienced and to help others make their loan with greater confidence, this report is designed to present guides for testing the earning capacity of the farm business.

* * * * * * * * * * * *

Walter Jones, a young farmer, hurries out of the wet, April drizzle and into the unimposing lobby of his local bank. He shakes the water from his hat and makes his way to the cashier's window where he greets the cashier, Mr. Smith, with:

"Good morning, Mr. Smith. I would like to talk with you about getting a loan."

Mr. Smith knows this young farmer as a hard working man who is honest and respected in his community. He also knows that he is heavily in debt and that any additional loan should be given careful consideration. To "talk it over" they go back to Mr. Smith's office where Jones continues:

"I need a combine this year. Last year I lost nearly a fourth of my oats because I could not get them combined at the right time. I also have a chance to buy two good cows from Jack Williams who is selling his herd this spring. I would like to borrow about $900."

Would You Approve This Loan? Obviously, more information is needed before a decision is made. It is to the banker's advantage to make this loan if it is one that can be repaid. It is to the farmer's advantage if it will make his farm business operate more profitably. However, the loan will be of no value to either one if Jones is unable to repay the loan or if he will be forced to liquidate part of his capital to pay his debts.

Mr. Jones is just starting his farm business. He has been operating the farm he is on now for the past five years and has lived on a farm most of his life. He has three children who will soon be starting school.

DECIDING ON THE LOAN

What are the questions that the banker should answer in making his decision on this loan? In years past, bankers and other loaning agencies have been inclined to view such a loan application with one question. "Is there collateral enough in this man's business to secure the loan?" If there is, make the loan and take a chattel on enough of the farmer's assets to secure the loan.

This often meant that young farmers starting in business had very little opportunity of borrowing sufficient funds to establish their farm business. Other farmers with sufficient assets were given loans that were a detriment to their business and their assets were soon taken as payment for debts.

However, in recent years there has developed a trend on the part of bankers and other persons making loans to farmers to take a more personal interest in their client's business. They have learned that their success depends upon the success of the men in their community.* What then should be the procedure for appraising the loan?

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* In 1932 W. R. McGaughey, then vice-president of the Millikin National Bank of Decater, Illinois, speaking on the University of Illinois' Farm and Home Week Program said: "The first question any banker should ask a farmer concerning a loan is, 'What is the money going to be spent for?'" More and more people are taking a similar attitude towards loans and some banks are now employing specially trained personnel to assist their farmer borrowers in making their business a success, thus insuring repayment of loans made to farmers.

Is the Farmer Honest? Certainly the first point to be considered is the honesty of the man asking for the loan. The banker must know the man and be satisfied that he is dependable and will keep his word. This report makes no attempt to tell how this should be done. Most bankers know, or at least should know, the folks in their community.

How Will the Loan Affect the Farm Business? Will this loan make the farm business more profitable? Will the purchase of the combine increase the cash receipts on Mr. Jones' farm more than it does the cash expenditures? Is this machine necessary to the efficient operation of the farm, as Mr. Jones suggests when he says he cannot get his grain harvested on time when he depends on outside help? Even though the cost seems high, it may be necessary to the efficient operation of the farm business.

Does Walter Jones have labor, feed, and housing facilities for the additional livestock he wishes to purchase? Will the returns from two additional cows be greater than the expense caused by their addition to the herd?

Answers in the affirmative must be made to questions like these before the loan can be justified. The use that will be made of the money and the part it will play in the farm business are important facts in making decision on the loan.

In this report an attempt will be made to answer the questions concerning the making of this loan and also to provide guides that will be helpful in arriving at answers to similar questions.

How Will the Loan be Repaid? Will there be sufficient income from Mr. Jones' farm to meet the operating expenses, such as: cost of feed, fertilizer, seed, repairs for buildings and equipment, fuel and

grease for the tractor; the cash living expenses of the family, clothing, food, doctor bills, recreation, and education; with money left for payment of the additional loan? Crop failures, hailstorms, and drought, of course, cannot be fore told. But the normal income and expenses of any given farm can be estimated very closely by giving attention to a few important features of the business.

Knowing the income and expense, it is a simple matter to see if the money will be available to repay the proposed loan. If it is evident that such money will not be available, then the banker cannot approve the loan. If it is a deserving case, but too much of a risk for the banker, the farmer may be able to secure a loan through the Farm Security Administration.

PART 1.

TESTING THE EARNING CAPACITY OF THE FARM BUSINESS

Estimating the amount of money that a farm business will return over a period of years is not an easy task. Prices of farm products fluctuate rapidly over a wide range. The individual productivity of farms vary, even within a community. Farmers vary in their ability to operate a farm. Among 167 farms in southern Michigan, the labor income for one year varies from a loss of over $2,000 to a profit of more than $11,000. (See figures 4-A, 4-B, and 4-C for variation in other factors.) The study of thousands of actual records kept by farmers provides a basis for conclusions regarding the factors influencing farm income and expenses.

Gross income is one of the most important items to consider when testing the earning capacity of the farm business. Money must be taken in if the business is to show a profit. High gross income is especially important in a farm business because many of the farm costs are fixed and remain about the same regardless of the amount of cash receipts. The cost of growing a crop of wheat that yields 10 bushels to the acre is about the same as for one that yields 30 bushels to the acre. It is also true that a cow that produces $100 of milk requires about the same amount of care, and eats almost as much feed, as the one that produces $200 worth of milk. Figure 2 shows the income and feed costs per cow for cows producing various quantities of milk. Obviously, the farm business with the highest gross income, other factors being comparable, will have the highest net income.

A score card for estimating farm earning capacity is presented on page 9. This score card is one of the major contributions of this

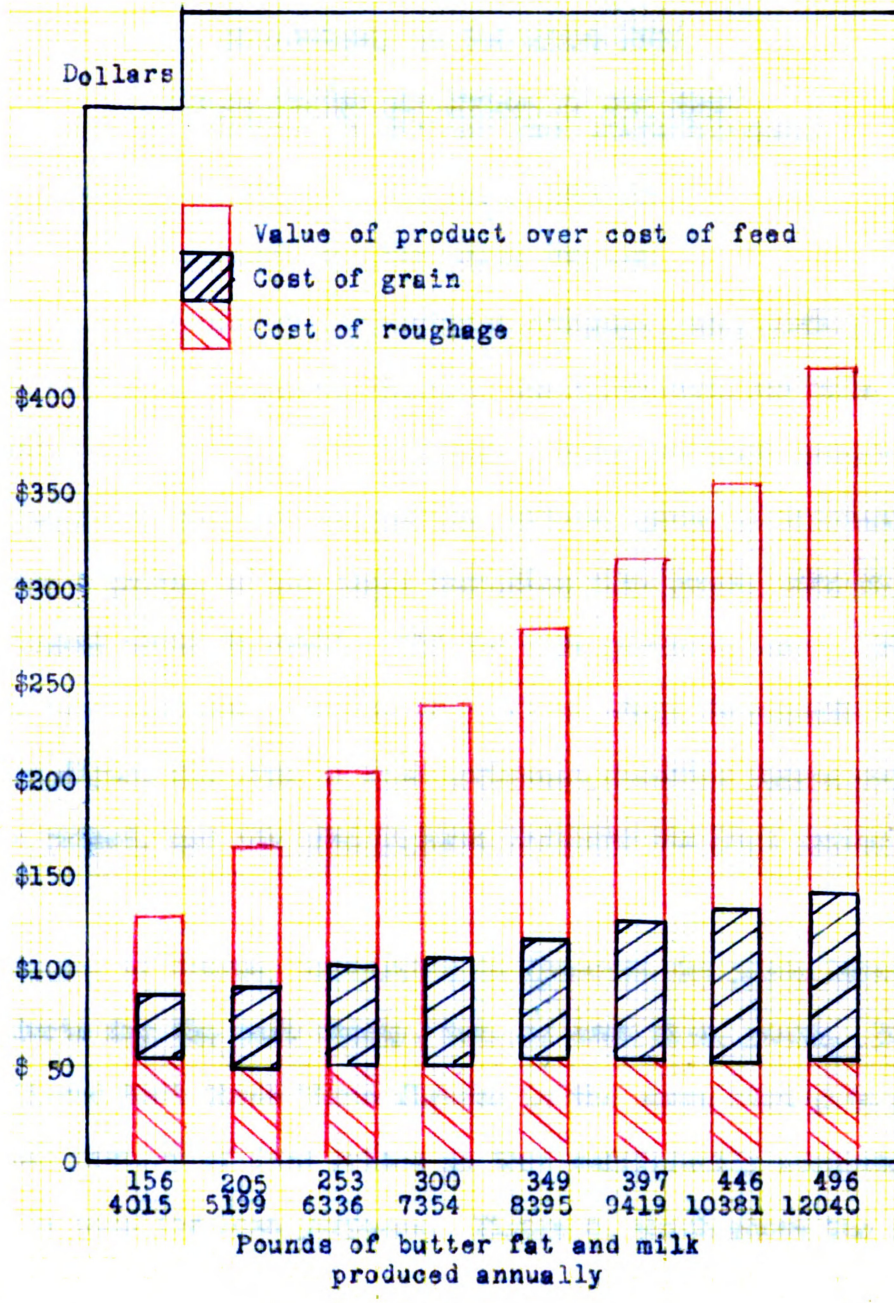

Figure 2. Value of product (milk or cream) and cost of feed per cow per year. From D.H.I.A. records 1943-44 (Mich.).

study. It emphasizes gross income. Gross income is synonymus with earning capacity. The problem, then, is "How much money can this farm business be expected to return in a given period of time?"

Explanation of the Score Card

"Gross Income per Animal or per Acre"
(This section is divided into three columns.)

1. Average income for the years 1935-44
2. Average income for the years 1941-45
3. Average income for the past calendar year, 1945.

The three divisions of this section of the score card are made to provide a more complete picture of the possible income from each enterprise. The income figure for the ten year period, 135-44, gives an indication of the income over a period of ten years including five years, 1935-39, which are considered about "normal". (If the five previous years, 1930 to 1934, had been included, the income would be about 14 percent less.*) The income figure for 1941 to 1945 indicates possible income over a five year period, and the 1945 figures indicate the most recent annual income.

It is, of course, impossible to forecast the price level for farm products for the next twenty, ten, or even five, years. However, it is believed that these three figures in the score card give enough of the past history of farm prices so that sufficiently accurate estimates can be made for loan purposes. Figure 5, which shows the index of prices received by farmers and prices paid by farmers since 1910, will be of interest in this connection.

Here is an example of how these three gross income figures may be used. If the proposed loan is in the nature of a production loan —

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* Based on U. S. Department of Agriculture, BAE, index numbers.

SCORE CARD FOR TESTING THE EARNING CAPACITY OF A FARM IN THE GENERAL FARMING AREA OF SOUTH-CENTRAL MICHIGAN

Source of income	Gross income			Income for this farm	No. of head or acres on this farm	Gross income for this farm
	1935-44	1941-45	1945			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Livestock:	Per animal					
Dairy cow						
Milk sales . .	$ 136	$ 198	$ 253	$____	_____	$_____
Other. . . (1)	$ 53	$ 60	$ 63	$____	_____	$_____
Laying hen						
Egg sales. . .	$2.75	$3.80	$4.86	$____	_____	$_____
Other. . . (2)	$1.00	$1.78	$2.00	$____	_____	$_____
Sow.	$ 275	$ 350	$ 350	$____	_____	$_____
Ewe.	$ 12	$ 14	$ 16	$____	_____	$_____
Feeder steer (3)	$	$	$	$____	_____	$_____
Beef cow . . (3)	$	$	$	$____	_____	$_____
Crops:	Per acre of the crop					
Wheat.	$ 25	$ 35	$ 50	$____	_____	$_____
Beans, field . .	$ 32	$ 42	$ 52	$____	_____	$_____
Beets, sugar (4)	$ 30	$ 40	$ 54	$____	_____	$_____

1.	Gross farm income for the year	$_____
2.	Operating expense (Assumed $\frac{1}{2}$ the gross income).	$_____
3.	Net farm income (Line 1 minus line 2).	$_____
4.	Income from other sources.	$_____
5.	Total net income (Line 3 plus line 4).	$_____
6.	Cash expenditures for family living.	$_____
7.	Amount available for debt payment (Line 5 minus line 6). . .	$_____
8.	Current payments on debts previously contracted.	$_____
9.	AVAILABLE FOR PAYMENT OF THE LOAN (Line 7 minus line 8). . .	$_____

1/ Income from sales of surplus stock such as calves, heifers, and cows.
2/ Income from sale of broilers, roosters, and hens.
3/ No records are available on these enterprises. A method of computing income figures for them is given in the Appendix.
4/ These income figures represent total beet sales less $\frac{1}{2}$ total sales for contract labor and hauling.

FIGURE 3. - SCORE CARD

No. tillable acres	Prod. man work units	Labor income*	Gross income	Operating expense	Income less expenses	Gross income per T.A.	Investment per T.A.
Highest in each item							
397	1,181	$13,892	$22,942	$15,877	$13,423	$122	$279
Bottom of first quarter							
182	615	$ 4,017	$ 8,822	$ 4,333	$ 6,211	$ 63	$161
Middle of each item							
143	500	$ 2,788	$ 7,022	$ 3,150	$ 3,988	$ 52	$127
Bottom of third quarter							
114	435	$ 1,853	$ 5,758	$ 2,037	$ 2,685	$ 42	$112
Lowest in each item							
56	195	$-1,548	$ 1,530	$ 741	$ 734	$ 7	$ 76

* Income less expenses, less a charge for unpaid family labor and operator's labor.

Figure 4-A. Variation in principle factors in the Farm Business. Type of Farming Area 5, 1945.

Note: The columns of this table are independent of each other.

The table should be read up and down and not across.

Dairy sales per cow	Other dairy income per cow*	Egg sales per hen	Other poultry income per hen**	Income per sow	Income per ewe
Highest in each item					
$405	$190	$9.48	$16.90	$642	$27
Bottom of first quarter					
$277	$ 64	$5.54	$ 3.65	$427	$20
Middle of each item					
$238	$ 40	$4.21	$ 2.00	$320	$16
Bottom of third quarter					
$200	$ 15	$2.48	$ 1.00	$207	$12
Lowest in each item					
$ 48	$ 1	$ .45	$ .20	$ 33	$ 3

* Includes income from sale of surplus stock such as calves, heifers, and cows.

** Includes income from broilers, roosters, and hens.

Figure 4-B. - Variation in Income Factors.
Type of Farming Area 5, 1945

Note: The columns of this table are independent of each other.

The table should be read up and down and not across.

Machinery expense per T.A.	Feed bought per T.A.	Crop expense per T.A.	Improvement expense per T.A.	Labor expense per T.A.	Misc. expense per T.A.
Highest in each item					
$18.68	$36.29	$15.59	$9.71	$23.60	$7.08
Bottom of first quarter					
$ 6.64	$ 9.07	$ 4.43	$2.65	$ 4.00	$2.12
Middle of each item					
$ 5.67	$ 4.46	$ 3.48	$1.92	$ 1.50	$1.33
Bottom of third quarter					
$ 4.13	$ 2.37	$ 2.52	$1.36	$ .51	$ .93
Lowest in each item					
$ .92	$ .13	$ .75	$ .58	$ .00	$ .21

Figure 4-C. - Variation in Expense Factors
Type of Farming Area 5, 1945.

Note: The columns of this table are independent of each other.

The table should be read up and down and not across.

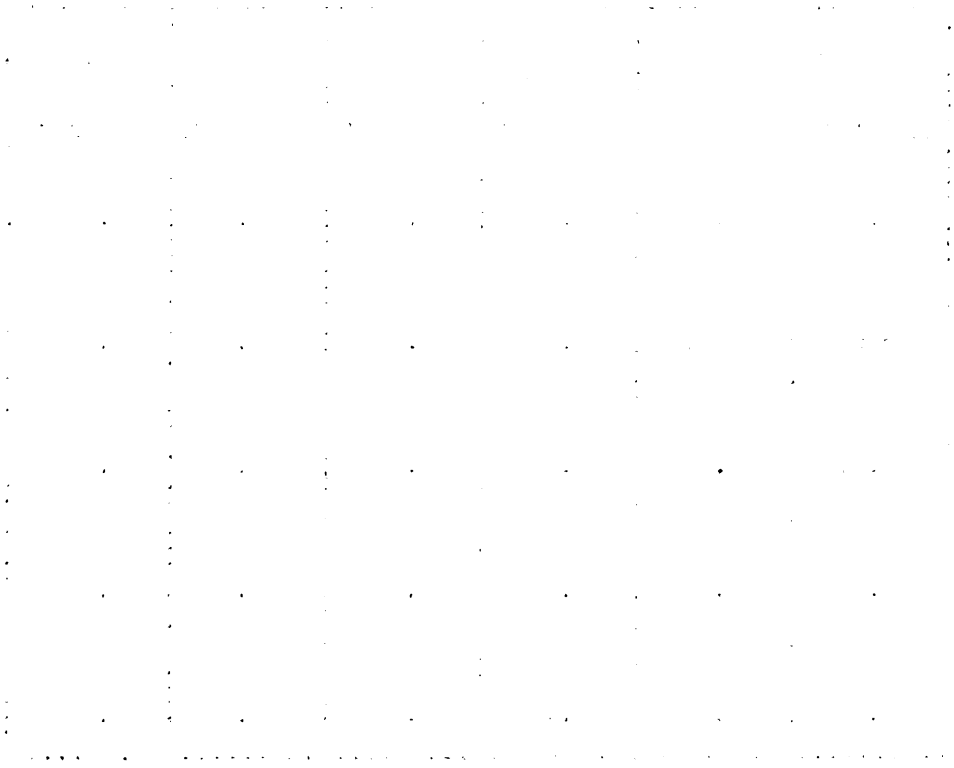

Figure 5-A. Index of Prices Paid and Prices Received by Farmers 1910 to 1945.

The gross incomes for beef cattle and feeder steers are based on the best available information at Michigan State College.*

"Income to be Used for This Farm" - - In this column place the income selected for use with the farm in question. As previously indicated, several factors should be considered before arriving at this figure. Four of the most important are:

1. The length of time required for repayment of the loan
2. General business conditions anticipated during that period
3. Productivity of the farm as compared with the average
4. Ability of the farmer to operate the farm

In selecting this income figure it is wise to remember that the incomes per cow, sow, ewe, and hen, for individual farms vary a great deal. Figure 4 shows the individual figures for 1945 on the 142 farms in Type of Farming Area 5.

"Gross Income for This Farm"- - The figure for this column is found by multiplying the income per animal or acre, column five, by the number of head or acres in column six.

Summarizing the Estimates

(1) "Gross Farm Income for the Year" - - This is the sum of items in column six of the score card.

(2) "Operating Expenses" - - Operating expenses as here considered, include feed bought, depreciation and repairs on machinery, hired labor, crop expense, depreciation and repairs on improvements, taxes and

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* Wright, K. T. and Taylor, H. B.
1938. BEEF FEEDING COSTS. F. M. 208 Michigan State College
Note: Other than the study mentioned above, there are very few data available on these incomes. Few actual records are available. The figures used have been adjusted to conform to prices of the periods and usual feeding practices.

miscellaneous expense such as telephone bill and subscriptions to farm papers. On the average, farm operating expenses will be about one-third to one-half of the gross income. If the production per unit (per animal and per acre) is high, then the percent of gross income needed for expenses will be less.

(3) "Net Farm Income" - - Subtract expenses from gross income.

(4) "Income from Other Sources" - - Enter here any income earned away from the farm and not included in the farm business such as work off the farm and custom work. Be sure to enter the NET amount. Subtract any costs such as transportation, fuel, hired labor, and supplies.

(5) "Total Net Income" - - Farm income plus other income.

(6) "Cash Expenditures for Family Living" - - The amount of cash that will be needed for family living expenses -- food, clothing, medical care, insurance, education, entertainment - - should be deducted from the total net income. This amount will vary within wide limits. Size of family and age of the members influence the necessary expenditures. A summary of records kept by 18 Michigan farm families in 1943 showed an average cash expenditure of $1,081 per family.*

(7) "Amount Available for Debt Payment" - - Total net income less cash expenditures for family living.

(8) "Current Payments on Debts Previously Contracted" - - This should be the total annual payments, interest and principle, that have already been contracted by the farmer. Installments on furniture or other household goods should be included.

(9) "Amount Available for Payment of Proposed Loan" - - This rep-

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* Unpublished data from Home Economics Extension Department, Michigan State College, East Lansing, Michigan.

presents the amount of money that will be available during the year for payment on the proposed loan. If it is not an amount that will retire the debt, then perhaps the time of payment can be extended over more than one year. Terms of the loan should be made on the basis of this amount.

How the Score Card Works for the Jones' Farm

(See example score card on page 16)

Assume that Mr. Jones, mentioned earlier in this report, has the following numbers of livestock and acres of cash crops.

Dairy cows (including the two he wants to buy) . . . 10

Laying hens (average number for the year). 200

Brood sows (farrowing two litters a year). 3

Wheat. . . . . acres 18

Sugar beets. . . . . acres 6

Mr. Jones is growing enough feed grains and hay to feed the livestock. He has adequate housing for the additional cows and he also has a surplus of labor on the farm. It has already been mentioned that he has had considerable farm experience and is ambitious. For this example assume that he is above average in his ability to operate and manage a farm, but that his farm is below average in productivity. Crop yields in the past have not been average for the community although they have shown improvement the last two years.

The Dairy Enterprise - - Since the loan, if it is made, will be in the nature of a production loan it should be repaid within two years. Use the income figures for the past year adjusted to fit the Jones' farm. Although Mr. Jones is at least average in his ability, it is best to be slightly conservative and the figures in the table are probably more

An Example: - -

Score Card for Testing the Earning Capacity of the Walter Jones Farm

Source of income	Gross income			Income for this farm	No. of head or acres on this farm	Gross income for this farm
	1935-44	1941-45	1945			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Livestock:						
Dairy cow		Per animal				
Milk sales . .	$ 136	$ 198	$ 253	$ 240	10	$2,400
Other. . . (1)	$ 53	$ 60	$ 63	$ 50	10	$ 500
Laying hen						
Egg sales. . .	$2.75	$3.80	$4.86	$4.80	200	$ 960
Other. . . (2)	$1.00	$1.78	$2.00	$2.00	200	$ 400
Sow.	$ 275	$ 350	$ 350	$ 300	3	$ 900
Ewe.	$ 12	$ 14	$ 16	$ - -		$
Feeder steer (3)	$	$	$	$		$
Beef cows . .(3)	$	$	$	$		$
Crops		Per acre of the crop				
Wheat.	$ 25	$ 35	$ 50	$ 35	18	$ 630
Beans, field . .	$ 32	$ 42	$ 52	$		$
Beets, sugar (4)	$ 30	$ 40	$ 54	$ 40	6	$ 240

1.	Gross farm income for the year	$6,030
2.	Operating expense (Assumed ½ the gross income).	$3,015
3.	Net farm income (Line 1 minus line 2).	$3,015
4.	Income from other sources.	$ 50
5.	Total net income (Line 3 plus line 4).	$3,065
6.	Cash expenditures for family living.	$1,000
7.	Amount available for debt payment (Line 5 minus line 6). . . .	$2,065
8.	Current payments on debts previously contracted.	$1,500
9.	AVAILABLE FOR PAYMENT OF THE LOAN (Line 7 minus line 8). . . .	$ 565

1/ Income from sale of surplus stock such as calves, heifers, and cows.
2/ Income from sale of broilers, roosters, and hens.
3/ No records are available on these enterprises. A method of computing incomes for them is given in the Appendix.
4/ These income figures represent total beet sales less ½ total sales for contract labor and hauling.

representative of better than average farms in Michigan. Two hundred and forty dollars should be a fair estimate of dairy sales per cow and $50 for income from sale of surplus stock, veal calves, and cows.

Poultry Returns - - Two hundred and fifty pullets are put in the laying house each fall and the number averages about 200 laying hens for the entire year. They are well cared for and egg sales in the past two years have been higher than most of the neighbors. An income of $4.80 from egg sales and $2.00 for returns from broilers, roosters, and hens, should be a conservative figure.

Sows - - The incomes in the score card are an average that include some sows farrowing two litters a year. Mr. Jones mentions that his sows will not farrow until late April so it seems wise to use an income figure lower than the average, as they will be marketed after the normal high seasonal price. Past history on this farm indicates that hogs do not usually do very well, so use $300 per sow.

Wheat - - Yields of wheat on this farm have not been average for the community and although the farm is improving in fertility through the efforts of Mr. Jones, a conservative income of $35 per acre is used. This is based on an estimated yield of 20 bushels per acre and a price of $1.75 per bushel. In using the full acreage of wheat in computing this income it is assumed that all of the wheat will be sold for cash and not fed to livestock. If some of it is to be fed, then only that portion expected to be sold should be used to compute the probably returns.

Sugar Beets - - A small acreage of sugar beets is being sown on one of the heavier soils on the farm. The farm is located several miles from the sugar factory and so the hauling costs will be somewhat above average. The value of $40 per acre should be fair based on a yield of seven tons per acre and a price of $11 per ton. (Less $\frac{1}{2}$ for contract labor)

Summary of Example - - Following the income figures found on the example score card, it is seen that the final amount arrived at for paying the proposed loan is $565. This means that Mr. Jones would be unable to repay the loan within one year, but could repay it in two years time. It would seem quite logical for the banker and Mr. Jones to agree that the loan be repaid either in small monthly payments over a two year period, or in two or three large payments, perhaps one this fall and another at wheat harvest time the following summer.

The Loan for a Combine

Before purchasing any piece of farm equipment certain factors should be considered. The primary consideration should, of course, be the effect on the net income of the farm business. As in any business, additional equipment can only be justified by an increase in net returns.

Obviously, certain items are necessary to every farm business. A plow, harrow, some form of power, and certain other impletments can usually be classed as essential. However, in some cases where only a small acreage is plowed, such as on a truck farm, even the plow might be non-essential if the plowing could be hired. Combines, corn pickers, balers, field choppers, and sometimes grain drills and other special tools fall in the catagory of non-essentials on many Michigan farms.

When is a Combine Essential?

In determining the need for a combine consideration should be given to the following:

1. Availability of custom operators

2. Importance and necessity for timeliness of the operation.

3. Size of the farm.

4. Amount of power and labor available.

If no custom operators are available or if they are available, but cannot be hired when the operation must be performed, it is necessary to own the combine. The farm should be large enough to make efficient use of the combine. Adequate power and labor should be available to operate the combine.

If the operation is one that can be omitted, such as cultipacking, or use of the rotary hoe then the machine cannot be considered essential to the farm business. If the operation does not have to be completed within a short period of time and can be delayed until custom operators can be hired, such as hulling clover seed, then the purchase of the equipment for doing the operation may not be profitable.

The cost of owning a machine can be determined by solving a simple problem in arithmetic. The following form and illustration shows how this is done.

	Combine
Original cost of the machine (combine)	$ 650
Salvage or trade-in value at end of useful life.	$ 100
Net cost of the machine for period used.	$ 550
Estimated length of useful life of machine . . . . . (See figure 7 for guide)	8 yrs.
Annual cost of depreciation. . . . . (Total net cost divided by years of life)	$68.75
Annual charge for interest on investment . . . . . (Six percent of original cost)	$ 39
Estimated annual cost of repairs . . . . . (Four percent of original cost)	$ 26

	Combine
Total annual cost of machine*	$133.75
Number of acres machine will be used on this farm	40
Cost per acre (annual cost divided by acres used)	$ 3.34
Cost of hiring this same operation done	$ 3.50

If the cost of owning the combine or other piece of equipment is greater than the cost of hiring the job done, but the farmer still feels that it is necessary to the efficient operation of his farm, then the possibility of doing some custom work with the combine should be considered. If custom work is to be done there must be labor available to do the work without jeopardizing work on the home farm.

This procedure can be applied to any other item of farm equipment.

When Should Additional Livestock Be Purchased?

In general, there is a direct correlation between the amounts of livestock kept and the net profit on most southern Michigan farms.** The more livestock, the greater the profit. In view of this fact most farmers in southern Michigan who are not specializing in another type of farming such as fruit or cash crops, should attempt to keep as much livestock as labor, feed, and buildings available will permit.

In considering the purchase of additional livestock, four factors should be given consideration:

(1) Labor - - Additional livestock should not be purchased if

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* If housing facilities are not available on the farm now, consideration should be given to the cost of providing some protection for most farm machinery. Depreciation will be high on machinery left outside all year.

** Wright, K. T., Michigan State College
1940. FARM SUCCESS FACTORS IN CENTRAL MICHIGAN.
Thesis,
(Ph. D.) Cornell University, Ithaca

they cannot be given proper care. Some farmers have more than they can care for without omitting some of the essential operations. Others, "putter" and spend a lot of time doing non-productive, non-essential work around livestock. Sometimes the addition of more equipment will enable the same number of men to take care of more livestock. On many farms the addition of extra cows or hens will make for more efficient use of labor.

(2) Feed - - The major part of the feed, other than concentrates, for the livestock to be purchased should be available on the farm. Purchase of some additional feed for high producing animals is often profitable, but as a rule it is better to have most of the feed, especially roughage, on hand that the additional animals will require.

(3) Housing - - Unless a major increase in one livestock enterprise is anticipated, housing space should be available before considering the purchase of more livestock. Many times the present buildings can be changed to make more room available. An old barn or the second floor of a barn can often be fixed up to accomodate more laying hens. The use of a pen-type dairy barn may permit the number of dairy cows to be increased.

Sows are usually kept in individual, portable cots that are inexpensive or made from old lumber, so housing is not often a limiting factor in increasing the number of sows. However, if feeder pigs are to be bought and fed through the winter, it is important that adequate space for housing and feeding be available.

Feeder steers also require considerable barn space and feed racks. Feeding steers is somewhat of a specialized business and should not be undertaken on a large scale unless the feeder has had considerable experience in feeding steers.

(4) Price - - Next in importance in considering the purchase of

additional livestock is the price that will be paid for them. In most communities there is a "going price" for livestock that is sold locally. This is usually a fair price, but it is wise to check this price with prices in other communities; or, if the livestock being bought is traded on the terminal market, check the latest market quotations. LOCAL AUCTION SALES ARE NOT A RELIABLE INDICATION OF THE MARKET VALUE OF LIVESTOCK.*

* The problems involved in buying and selling pure bred livestock for breeding purposes is outside the scope of this report.

PART 2

ANALYZING THE FARM BUSINESS

If the test of the earning capacity of the farm business shows that it is not sufficient to repay the proposed loan within a reasonable time, then it may be desirable to take a closer look at the farm business and see why the income is not greater and how it can be increased.

It is highly desirable that bankers and others making loans to farmers understand some of the factors that go to make up a successful farm business. Over a period of years, through the study of actual farm records, certain things have been found to be closely associated with high incomes and others with low incomes. For those who wish to make a more detailed study of the farm business this report presents a suggested method for analyzing the farm business. In this analysis, seven major factors in the farm business are considered:

1. Size of business
2. Soils program
3. Crop program
4. Livestock program
5. Expenses
6. Efficiency
7. The farmer

These will be discussed in the order named.

Size of Business

One of the most common faults of the farm business in southern Michigan is the lack of an adequate amount of productive work. It may seem paradoxical to say that any farmer does not have enough to do, but very often he does not have sufficient volume of business to make a profit. In

analyzing the farm business, then, the first item to consider is the size of business.

There are three methods commonly used for measuring the size of the farm business.

(1) Number of productive man work units

(2) Gross income

(3) Number of tillable acres in the farm

(1) Productive Man Work Units (P.M.W.U.) - - A productive man work unit is the amount of work one man will do in one ten hour day. The total P.M.W.U.'s in a farm business is found by multiplying the number of dairy cows, sows, and other livestock by a factor derived from cost account records. These factors and the P.M.W.U.'s for the Jones farm are on page one of the Appendix.

Figure 8 indicates the relationship of P.M.W.U.'s to labor income. Farm records also indicate that a successful farm business should provide between 300 and 400 P.M.W.U.'s per man. This means that if there are two men on the farm all year, plus some seasonal help, the total P.M.W.U.'s for the farm should be about 700 to 800. Do not neglect the amount of family labor contributed in computing the number of men available on the farm. Most farms in southern Michigan will have at least 1.5 men, counting family labor and hired labor during harvest. It can also be said that, in general, the farms in southern Michigan with less than 400 P.M.W.U.'s are not making money.

(2) Gross Income -- When gross income is compared to the investment in the farm business it is a good measure of the size of business. By itself, it is not as good as P.M.W.U.'s

On farms with a total investment of from $8,000 to $15,000 the gross income should equal the total investment in three to four years. On farms with an investment of greater than $15,000, the gross income should equal the total investment in five years. As a guide to estimating the total investment of a given farm, the average investment per tillable acre for 142 farms in central Michigan in 1945 was $130.

(3) Number of Tillable Acres - - On most farms this is by far the easiest figure to compute. If the type of farming is also considered, this is a fair indication of the size of the business. However, a forty acre fruit or truck farm may have more business than a 120 acre cash crop farm. A dairy farm of 120 acres where large amounts of feed is purchased may have a larger business than a 240 acre farm specializing in sheep or beef cattle. Number of acres is very often an indication of the possible size of business.

In 1945 the average size of a farm on the 142 farms in area 5 was 160 tillable acres as compared with 153 acres in 1944. The average size of farm is becoming larger. Increased mechanization and shortage of labor is forcing farmers to handle more acres to utilize their labor and reduce machinery costs per acre. On the basis of past records, farms with less than 160 acres are not making efficient use of machinery and equipment.

Methods of Increasing the Size of the Farm Business - - The size of the farm business can be increased by the following changes in the farm program.

(a) Increase the Amount of Livestock - - This is one of the easiest and most effective ways of increasing the volume of a farm business. Another dairy cow or a few more chickens does not greatly increase the labor or overhead expense and it does not materially add to the gross income.

(b) Change to a More Intensive Class of Livestock - - Dairy cows

and poultry are considered intensive classes of livestock. Beef cattle, sheep, and hogs are extensive.

(c) Improve Livestock Production - - Gross returns and the size of the business can often be increased simply by keeping better care of those already on the farm.

(d) Rent or Buy Additional Productive Land - - This method should be given careful consideration. Equipment should be available for handling additional land and it should be procured at a reasonable cost. The quality of the land should be investigated. There is little profit in working poor land.

(e) Improve Crop Yields - - Improve cultural practices. Increase amount of fertilizer used. Use adapted, good quality seed.

(f) Locate or develop Better Markets - - Many farmers have been able to build up a special trade for their products and in this way get a higher price. If a reputation for high quality is established most people will gladly pay slightly more than the market value.

Soils Program

Unproductive soils or improper use of the soil are often the cause of an unprofitable farm business. Soils are basic to the farm business. They determine, to a great extent, the kinds and amounts of crops than can be grown. Climate is also an important factor but little can be done to change the climate unless the farmer moves to another region. A great deal can be done about the way in which the soil is handled.

Low crop yields and failure to get good seedings is perhaps the best indication that the soils are the weak spot in the farm business. Poor or improper crop and soil management will also cause low crop yields, but con-

sistantly low crop yields and failures to get seedings usually indicate one of the following - (1) the crops grown are not suited to the soil, or (2) the fertility of the soil has been depleted by years of mis-use.

Growing the right crop on the right kind of soil is very important. Many farmers in Michigan are still trying to grow corn on soil that is sandy and rolling in topography. Some years they get a crop, but many years they fail completely. Many farmers plant field beans on light land well suited to alfalfa or wheat and wonder why they fail to get a good yield. A good rule to follow is "Grow the kinds of crops that will do at least average or better on your farm".

It is very poor business to let the personal preference or likes and dislikes of the farmer or his wife influence the kinds of crops grown or the kinds of livestock kept. If they like corn and hogs and insist on making that the dominate enterprise, then they should move to a farm where those enterprises can be carried on profitably, rather than to mis-use a piece of sandy loam that should be growing berries and fruit. The soil and the markets should determine the type of farming and not the likes and dislikes of the farmer. It is true that within certain limits personal preference can be given consideration. Most people do better at the job they enjoy, but it must be realized that there are very definite limits to the range of crops that can be grown successfully on each farm.

The maintenance of soil fertility is of utmost importance in the production of high yields. Follow the recommendations of the county agricultural agent and the soils department of Michigan State College.

(1) Test the soil for acidity - Lime if necessary

(2) Make liberal use of commercial fertilizer - one hundred pounds or more per acre per year is not too much

(3) Apply barnyard manure frequently and in thin applications.

(4) Make maximum use of green manure and cover crops

Crops Program

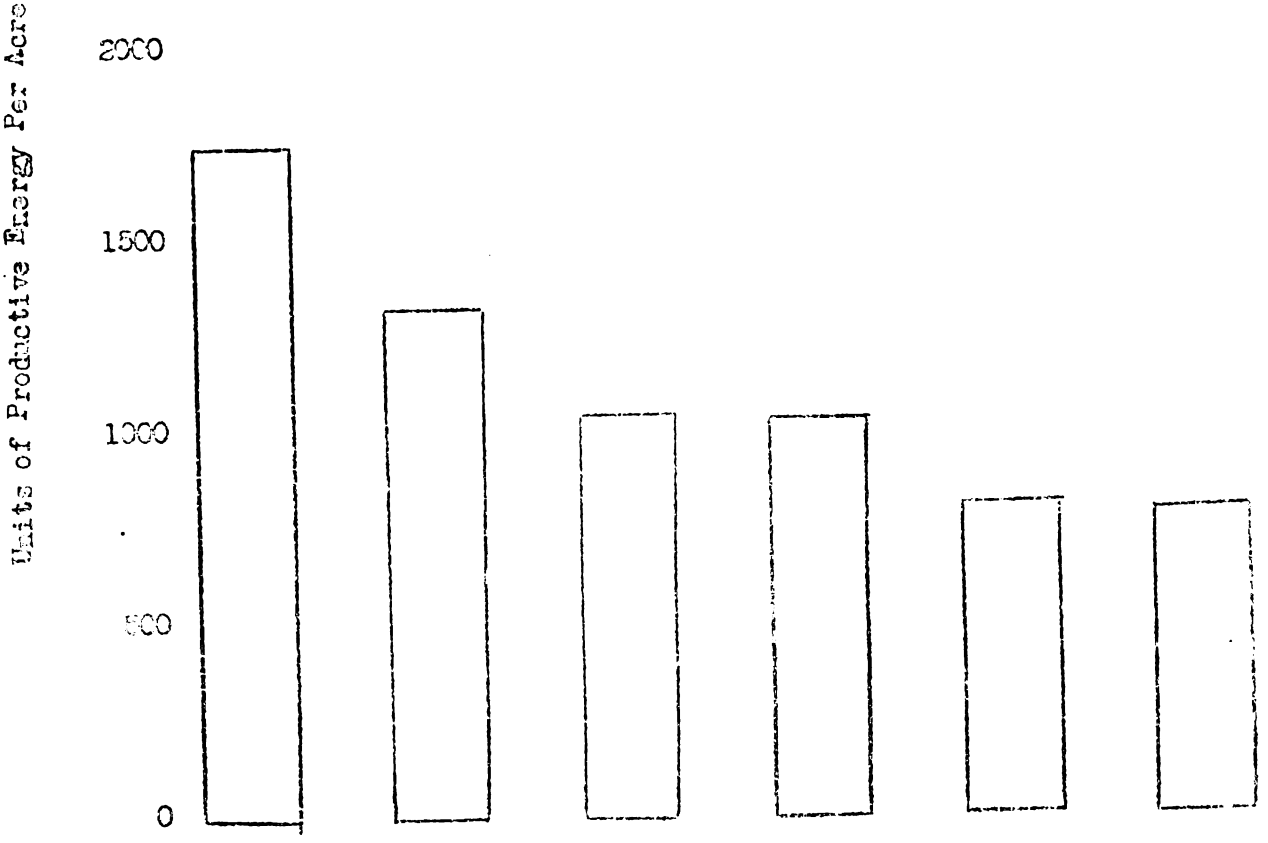
Crops grown should be adapted to the soil, climate, and use for which they are needed. Let the crops determine the kinds and amounts of livestock kept, and let the soil and climate determine the crops. This cannot be a hard and fast rule. Many times there is a choice of several crops that will grow almost equally well on the same farm. Then the use or market available should be considered. Quite often it is good business to grow the crops grown by the majority of farmers in the community. Years of experience have, to a great extent, established those crops that are most profitable.

However, some farmers with initiative and ambition make a success by being different. This difference is usually a unique way of marketing, or a specialized type of farming such as truck crops, broilers, and is seldom, if ever, a wide variation from the usual use of soils and crops grown in the community.

A suitable rotation should be followed. This practice has ceased to be an experiment in any sense of the word. The rotation may be long or short. In cases of tillable pasture it may remain in one crop several years in succession; but must be reseeded and fertilized regularly. Include a cash crop in the rotation if climate, soil, and markets are suitable. A cash crop such as wheat, beans, or sugar beets offers one more source of income to the farm business.

Grow as many "High-value" crops as possible. See figure 9 for comparison of per acre value of various crops based on their yield of

Percentage of Tillable Land in Different Feed Crop, Crop Yields, Feed Value and Cash Value Per Acre of the Various Crops on Accounting Farms in the Dairy and General Farming Area of Michigan (Area 5)



	Corn*	Alfalfa hay	Other hay	Wheat*	Oats*	Barley*
1933-42 % til. acres in crop	17	15	7	11	13	2
1933-42 average yield	37	1.9	1.4	22	38	31
Oct. 15, 1943 price	$1.13	$13.70	$11.60	$1.64	$ .84	$1.14
Oct. 15, 1943 Crop value**	41.81	26.03	16.24	36.08	31.92	29.76

*No allowance was made for feed value of stover and straw.

**October 15, 1943 price and 1933-42 average yields were used, and no value placed on stover or straw.

Figure 9 - Relationship of Crops on Per Acre Basis

energy for livestock feed. Most successful farms in southern Michigan have about 40 percent of the tillable acres in hay and pastures. On many farms, where soil and topography are less suited to row crops, this percentage can be increased to 50 percent or more.

Livestock Program

The sale of livestock and livestock products provides the majority of income on most southern Michigan farms. Fruit farms, truck crop farms, and those specializing in cash crops such as sugar beets, bean, or potatoes, are the principle exceptions.

How Much Livestock?- - Enough livestock should be kept to utilize available feed, labor and buildings. Buying additional feed is good business if it can be bought at a reasonable price, and if it is the limiting factor in the livestock enterprise.

What Kind of Livestock? - - Keep the kinds of livestock adapted to the farm. If the soil and topography, are best suited to production of forage crops, then keep livestock that will make efficient use of roughage. Cattle, especially dairy cattle, are the most efficient users of roughage. If the farm is best adapted to the production of corn and other row crops, the dominant livestock enterprise might well be hogs or beef cattle. Available markets must also be given consideration in the selection of the livestock enterprises. A location near a large city may mean that dairy cattle and poultry will be most profitable even though much feed must be purchased.

Keep High Producing Animals - - High production per animal is essential to a profitable enterprise. At least average production should be maintained and low producing animals should be sold.

Use Approved Management Practices. Follow recommendations of the county agricultural agent and those used by successful farmers in your community.

Plan Your Marketing Program. Plan production so that the majority of products can be sold when seasonal price is highest. Egg prices are highest in the fall months, so buy baby chicks early and have laying flock in production in October. Hogs sold before October usually bring a higher price than those sold later in the fall. Plan to have sows farrow so that pigs can be sold in September.

The likes and dislikes of the operator of a farm should be given minor consideration in the selection of livestock enterprises for the farm. While it is true that he will take a greater interest in, and give better care to animals that he likes, the economic (markets, supply and demand) and the natural (soil, topography, and climate) factors are so much more powerful than any personal factor that it should be given little consideration. It is sometimes surprising how quickly the likes and dislikes of the operator will change when he finds that what he disliked makes more money for him than what he like. If more than one enterprise has an equal chance of succeeding on the farm, then the choice may be dependent on the operator's fancy.

Expenses

Expenses are not usually an item of major importance in analyzing the farm business. Many people merely check the farm buildings, and machinery to see that they are adequate and not excessive. If there are many unusual items of machinery around the farm, more than most farmers in the neighborhood have, then it would be well to investigate further to see if

efficient use is being made of this machinery. The same can be said of buildings.

Some times the profit on the farm business would be greater if more money was spent, FOR THE RIGHT ITEMS. Money spent for fertilizer is profitable. Latest information indicates that amounts up to at least 100 pounds per acre per year at present fertilizer prices will return a profit above cost. Purchase of additional feed very often enables a farmer to improve his livestock income well above the cost of the additional feed. Reducing expenses by buying low priced, untried, unadapted, poor quality seed is never profitable.

Efficiency

Efficiency may be one of the most difficult factors in the farm business to measure and also one of the most difficult to change. Human beings are creatures of habit and it is often difficult to get farmers to change their habits of doing farming operations to increase their efficiency. Recently, work has begun in several land grant colleges to study the working methods of farmers in an attempt to help them improve their efficiency. This research work is called "time and motion study" and is similar to the work done in industries by time study engineers. Results are already showing places where many farmers can improve their work efficiency. No attempt is made in this report to present any of the results, but here are some guides based on past records and experience that can be helpful in judging the efficiency of a farm business.

Labor - - Comparing the amount of work done by the operator and that done by other farmers is some indication of his efficiency. The following table gives some measure of labor efficiency. The values for each

column are arranged from the high to the low, and the average approximately in the middle. By placing a line across the column at the point where the figure for an individual farm fits, the rank of the labor efficiency, as judged by this chart, for this farm can be readily seen.

Work units per man	Cows per man	Hens per man	Cwt. of milk sold per man
390	17	1,350	1,250
320	14	1,100	1,000
290	12	850	830
270	11	700	720
250	10	620	640
240	9	580	600
220	8	530	550
200	7	470	490
180	6	400	420
150	5	300	300

(From FARM BUSINESS CHART, Deptartment of A.E., N.Y. State College of Agriculture, Ithaca, N. Y.)

Buildings - - Farm buildings should be adequate but need not be expensive. Well painted buildings are desirable but may not be an indication of the efficiency of the farm business. These points should be considered in checking the buildings for efficiency.

1. Are they adequate for the farm business?
2. Is there sufficient storage space for feed and supplies, and room for housing livestock?
3. Is all or most of the building space available being used, or could more livestock be housed?

4. Could buildings be altered to accomodate more livestock or reduce their upkeep?
5. Average investment per tillable acre in buildings and improvements on 142 farms in types of farms, area 5, in 1945, was $31 and annual expense per tillable acre was $1.93.

Machinery - - Efficient use of power and machinery is necessary to a successful farm business. Check the efficiency of this item by these points.

1. Is there sufficient machinery to do the necessary farm work?
2. Does the farmer have high cost machinery that is not being used except in a very limited way? Corn pickers, combines, field choppers are examples of high cost machinery.
3. The average investment in machinery on the 142 farms in type of farming, area 5, in 1945 was just over $19 per tillable acre, and the annual expense per tillable acre was $5.30.

The Farmer

It is difficult to measure the ability of the farmer to farm except by his past record. Even the past record may not be completely accurate. One farmer may start with a better farm or prices may be in his favor. A series of accidents or poor health may cause a farmer to be unsuccessful from the standpoint of making money on his farm.

Many people have attempted to set up guides for judging the ability of the individual to farm. The condition of the buildings, whether the weeds are kept cut, neatness of the farm yard, and many others, have been used as an indication of the ability of the farmer to manage and operate a farm efficiently. When asked to give what he thought to be

the most important trait of a good farmer, an elderly but successful farmer said, "Getting up early in the morning." Perhaps this is as good a criterion as any.

Most bankers have learned by experience and through their knowledge of the people in their community, how to judge the ability of a farmer. Each has his own preferred method and if it works for him it is sufficient. To add to the guides already mentioned, here are some of the more important indications of managerial ability from the stand point of good farm management.

(1) Timeliness of Operations - - Are the crops planted at the proper time or is the farmer always just a few days later than his neighbors (on similar soils)? Is he always so late with his corn planting that he is late making hay and consequently late harvesting wheat? If he has insufficient equipment to do the work with, or if the soil is poorly drained or of such a nature that farming operations cannot be performed on time, then these should be remedied before criticising the farmer for being a poor manager.

(2) General Organization of the Farm Business - - Is the farm operated efficiently? Does the farmer make four trips to town when one would be sufficient if he had planned his work? Does he have his livestock arranged so that he can care for them easily, or is the grainery a long way from the livestock and does he have to carry hay and bedding rather than just throw it down from the mow? Some of these things may be unavoidable because of arrangement of the buildings but a good manager will find short cuts and if possible, re-arrange the buildings.

Does he spend much of his time around the house and barn "puttering" or fixing machinery during the summer season when most of his neighbors

are busy in the fields? If he is spending several hours a day fixing machinery and chasing livestock that broke through a poor fence he is not planning his work efficiently.

(3) Points of Minor Consideration - - Most of the items mentioned in the first paragraph of this section can be used occasionally as minor guides to the efficiency and managerial ability of the farmer. Care should be taken to avoid placing too much emphasis on them. The farm making the most money is not always the one with the neatest or best painted buildings.

From the standpoint of making the farm pay, many of the minor items that are very obvious to the casual observer are not very important. Failure to make minor repairs and repaint buildings on a rented farm are not an indication of the operators managerial ability. A well kept lawn and neat farmstead may only mean that there is extra labor around the farm to take care of such items or it may mean more important work - - from a business viewpoint - - has been neglected.

However, poorly kept fences allowing livestock to get out frequently, or broken machinery are an indication that necessary farming operations are not being done correctly or on time. Neatness is certainly a virtue and one very desirable in the farm business but it is not always an indication of the dollars and cents being taken in by the business.

THE PLACE OF CREDIT IN THE FARM BUSINESS

During periods of high prices it is good business to pay off debts. A farm business with low indebtedness can continue to operate even if prices fall, while one that is heavily in debt may be forced to liquidate its assets. Mortgaging the farm business above the "normal" long-time value is dangerous because it leaves the business vulnerable in case of falling prices. It is a well known fact that farm prices go up first and go higher, drop first and go lower than prices of other commodities.

However, going in debt for legitimate business reasons should be admired and not ridiculed. In the past few generations of farmers it has been considered somewhat of a disgrace to "be in debt". It was often looked upon as an indication of a "poor farmer". In reality, borrowing money is as legitimate a business transaction as buying a ton of feed, IF THE MONEY IS SPENT PROPERLY. A large portion of this nation's business is conducted on credit, and so there should be no stigma attached to the making of a business loan. With the amount of capital required today to own a farm business, it is virtually impossible for anyone starting a farm business to own all of the business. Investments are now running as high as $20,000 to $30,000 on Michigan farms and on the larger farms of the corn belt, investments of upwards to $200,000 are not uncommon.

Even for the owner of a farm who has all of his business paid for, borrowing money is often good business. Few farmers are able to maintain sufficient amounts of capital to take care of more than small investments. On many smaller farms capital is the limiting factor in their business and it is impossible for them to operate at capacity without borrowing additional capital. Other farmers fail to take advantage of buying in carload lots or even by the ton because they do not have sufficient money to

do so, and are not willing to borrow money. A saving of several dollars can sometimes be made by buying in large quantities when the price is low.

Buying on the installment plan and having merchants provide credit is usually more expensive than getting a straight loan from a bank or other loaning agency. Banks are in business to loan money and can therefore usually provide additional capital cheaper than merchants who are in business primarily to sell goods.

In borrowing money farmers should not be misled by low monthly interest rates. Many credit agencies advertise a low rate of interest when in reality the total cost of the credit is very high.

SUMMARY

In this study the author has attempted to bring together information that will be useful to bankers and others making loans to farmers. Throughout the study an effort has been made to approach the problems of farm credit from the viewpoint of both the banker and the farmer. It has been pointed out that they are both a vital part of any rural community and that they should have an understanding of each others problems.

Making a loan to a farmer involves more than the signing of a note or chattel mortgage. It involves consideration of the use that will be made of the money and the effect of this loan on the farm business. In reality, the banker making a loan to a farmer is buying an interest in the farmer's business for the period of the loan. He should, therefore, be vitally interested in the condition of that business and not just in the assets available for collateral.

A review of the literature in the field of farm credit indicates that very little has been written that gives actual income figures to be used in estimating farm income. The author believes that it is essential to have an actual income figure as a starting point in estimating farm income. Dairy sales per cow, egg sales per hen, and other income figures in a dollar and cents value based on actual farm records provide a base for estimating farm income possibilities.

The score card presented in part one of this report is designed as a guide in estimating the annual income that can be earned on a given farm. The method of using the score card is illustrated by applying it to the Jones' farm and his application for a loan to buy a combine and two additional dairy cows.

The three income figures given in the score card give an indica-

tion of the income for one year, a period of five years, and a long time or ten year period. It is important that these guides be used as guides and not as exact figures to be used for all farms. In fact it would be a rare farm that would be suited to the average income figures in each enterprise. It is necessary to know the farmer and the farm before using this score card.

Analysis of the farm business is essential to improvement in its operation. Part two of this report provides a procedure for analyzing the farm business. Standards are given that can be used in judging the various factors of the farm business. Seven factors are discussed in detail. They are:

1. Size of business
2. The soils program
3. The crops program
4. The livestock program
5. Expenses
6. Efficiency
7. The farmer

Credit is an essential part of any business. Lack of sufficient capital often prevents farmers in southern Michigan from operating at the full capacity of their business. On most of these farms labor is a surplus item and capital is the limiting item. Borrowing of additional capital for the purpose of providing means of utilizing the surplus labor is good business. Farmers should not hesitate to borrow money for legitimate business expenditures, and bankers should realize that loans to farmers are one of the best investments they can make. They should also understand some of the problems involved in agricultural production and be prepared

to make the terms of the loan on the basis of the farm's earning capacity.

Methods of repayment should be adjusted to fit the production cycles of the farm business. A loan for seed and fertilizer for a potato crop would normally be repaid at the time of sale of the crop whether it was six months or a year after the making of the loan. However, a loan for the purchase of a dairy cow might well be repaid in small monthly installments from the sale of the dairy products.

Knowing each other and understanding each other's business will make the banker-farmer team a more profitable arrangement for both the farmer and the banker. It will also help to establish a more stable agriculture and a more prosperous and progressive rural community.

APPENDIX

ESTIMATED LENGTH OF LIFE OF FARM MACHINERY

Item	Estimated length of life
Combine	9 years*
Corn binder	14 years
Corn picker	9 years*
Corn planter	15 years
Cultivator, two-row	15 years
Ensilage cutter	10 years
Feed grinder	15 years
Grain binder	16 years
Grain drill	18 years
Harrow, disk	15 years
Harrow, spring tooth	8 years
Hay loader	20 years
Hay rake, side delivery	16 years
Manure spreader	14 years
Mower	15 years
Pick up baler	8 years*
Plow, sulky	16 years
Plow, tractor	9 years
Tractor	8 years

This information, except as noted, is taken from AGRICULTURAL MACHINERY by J. B. Davidson, page 349.

* Estimated from experience of Agricultural Engineering Department, Michigan State College.

COMPUTING PRODUCTIVE MAN WORK UNITS

Enterprise	P.M.W.U.'s per head or acre
Dairy cow	15.0
Beef cow	3.0
Mature bull	10.0
Heifers, calves or bulls under 2 years being raised	3.0
Steers or other cattle to fatten	2.0
Stallion	15.0
Colts	4.0
Ewes (mature and yearlings)	0.5
Lambs raised	0.1
Feeder lambs	0.1
Brood sows	3.0
Boars over 6 months	2.0
Hogs raised to 200 pounds	0.5
Hen	0.18
Pullets raised	0.10
Broilers	0.02
Turkeys and geese	0.30
Turkeys raised	0.15
Crops	
Corn for silage	2.5
Corn for grain	3.0
Barley, oats, or wheat	1.0
Alfalfa, clover or mixed hay	0.7
Beans	2.5
Potatoes(table stock)	6.0
Potatoes (certifed)	9.0

Sugar beets (all labor)	15.0
Sugar beets (contract labor excluded)	3.0
Alfalfa or clover seed	1.0
Summer fallow	0.7

FEEDER CATTLE

In 1937 and 1938 a study of the costs and returns in feeding steers was conducted by Dr. K. T. Wright and Professor H. B. Taylor of Michigan State College. Thirteen steer feeders cooperated in the study by keeping complete records on their feeding operations. A total of 486 head of steers and heifers were included in the study. This study provides the only complete figures on income from feeding cattle that is available at Michigan State College.

According to this study the net profit per steer averaged $23.15. However, the feeding enterprise has so many variations that it was deemed desirable to omit a gross income figure for this enterprise in the score card.

Income from feeding cattle will depend on the grade of cattle purchased, how long they are fed, whether they are fed largely on roughages or on grain, when they are purchased, when they are sold, and on the ability of the feeder to care for the cattle. At the writing of this report (August 1946) the spread in prices on the Chicago market ranges from $27.75 for choice steers to $18 and down for common grades and down to $10 for cows. With variations such as these in market prices it is practically impossible to compute a general income figure that will be of any value in estimating income from feeding cattle.

In making loans for the purchase of feeder cattle the banker should consider very carefully the ability and experience of the farmer in handling this type of enterprise. An experienced feeder will usually be able to sell his cattle for at least as much as he paid for them. Disease, unforseen drops in cattle prices, and accidents such as fire and windstorm have been known to cut into even the orginal investment. However, an experienced feeder will have these hazards reduced to a minimum.

Men who successfully feed cattle usually will maintain the grade of cattle they feed. That is, if they purchase "good" calves they will expect them to grade "good" when they sell them as finished cattle. But if they buy "medium" or "fair" cattle to feed, they may expect them to grade "good" when they go back to market as finished cattle, if more fat has been the limiting factor in keeping their grade below "good" previously.

If the ratio between the price of feed and the price of beef is extremely favorable for feeding, feeders sometimes buy cattle, feed them for a limited time — thirty, sixty, or ninety days — and send them back to market without materially changing the condition or grade of the cattle, but making their profit on the added weight. On the other hand, thirty to sixty days feed may raise the grade as butcher cattle sufficiently to overcome relatively high feed costs.

A banker should consider the following points before making a loan for the purchase of feeder cattle.

1. The experience and ability of the borrower as a livestock farmer and his general success as a business man.
2. Does the farmer have adequate facilities — housing, feed racks, yards and fences — to care for the cattle?
3. Does he have feed on hand for feeding the cattle? If not, will he be able to purchase the feed at a price that will permit profitable feeding of the cattle? Buying all of the feed for feeding cattle is a specialized business practiced successfully by a few experts.

Much that has been said about feeding cattle also applies to feeding sheep and hogs. It is a specialized business and if the farmer has not had experience he should not invest heavily the first time.

BEEF COWS

Beef cows are not one of the dominant enterprises on south-central Michigan farms. Most farmers in this area have found it more profitable to keep dairy cows. However, some farmers prefer beef cows and if the economic and natural factors surrounding their farm are suited to beef cattle, they may be justified in making this one of their sources of income.

The records on the income from beef cows are insufficient to provide a reliable figure for the gross income from this enterprise. However, by making certain assumptions the following procedure will give an approximation of the income that can be expected from each beef cow. Prices are not included in this procedure because it is felt that more accurate income figures will be obtained by using prices for the grade of cattle produced on each farm and for the period of time concerned. Prices of beef cattle have much wider ranges than the price of most other livestock products.

Assume a herd of 100 good quality grade or pure bred beef cows.

On the average they will produce 85 calves each year, half of which will be males and half females.

The heifers will freshen at an age of two and one-half to three years and will normally be useful for at least five more years. This means that about 15 cows will have to be replaced each year.

The income from these beef cows will consist of (1) sale of feeder calves (whether sold on the market or credited to the herd and fed out on the farm) and (2) sale of cows being replaced.

(1) Sale of 70 calves (85 less 15 heifers for replacements) at an average weight of 350 pounds . . . . . $_____

(2) Sale of 15 cows at average weight of 1,100 pounds. . . $_____

Total in gross income. . . . . $_____

Divide total gross income by 100 to find income per cow.

With 1945 prices and assuming "good" calves this is about $45 gross income per beef cow.

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