

JULY 1964  
A. E. RES. 148

# 1963 DAIRY FARM MANAGEMENT WORKBOOK

A. E. SHAPLEY  
C. A. BRATTON



Department of Agricultural Economics  
Cornell University Agricultural Experiment Station  
New York State College of Agriculture  
A Contract College of the State University  
Cornell University, Ithaca, New York

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION . . . . .	1
PART I - FINANCIAL SUMMARY OF THE FARM BUSINESS . . . . .	2
Receipts . . . . .	2
Expenses . . . . .	4
Income . . . . .	6
PART II - ANALYSIS OF THE FARM BUSINESS . . . . .	7
Size . . . . .	8
Rates of Production . . . . .	10
Labor Efficiency . . . . .	11
Cost Control . . . . .	12
Farm Business Chart . . . . .	18
Financial Situation . . . . .	20
Goals and Objectives . . . . .	22
Three Year Comparison . . . . .	23
Budget . . . . .	24
Farm Business Summary (Average of 468 New York Dairy Farms, 1963) .	25

ACKNOWLEDGEMENT

C. A. Bratton, A. E. Shapley, R. S. Smith, and L. A. Stanton with the assistance of county agricultural agents in 38 counties supervised the farm business management projects and the records which made this summary and analysis possible. The summarization and tabulation of the books processed at Cornell was under the direction of G. H. Bull. Myrtle Voorheis was in charge of transferring the data to cards and all machine operations needed to calculate the various relationships used.

## 1963 DAIRY FARM MANAGEMENT WORKBOOK

Due to new technologies and practices in agriculture, a farm that is successful today will not be successful long unless changes and adjustments are made in the business. Therefore, a farmer must continually make changes in his business in an effort to maintain his income. Since most farmers are attempting to increase the income from the farm, the changes and adjustments must be even greater in number and complexity.

The purpose of this workbook is to aid the dairy farmer in analyzing his business so as to know where changes and adjustments must be made in an attempt to maintain or increase his income. Changes made as a result of business analysis and comparison of alternatives are more apt to pay dividends than those made on a whim or on the idea that "it worked for my neighbor."

To do a proper job of farm business analysis, there must be a good set of farm records. A prerequisite to using this workbook is a set of records such as might be kept in the "Cornell Farm Account Book" or Cornell's "Farm Business Record." If farm records have been kept, it is a simple matter to follow the guidelines in this workbook and thereby find out which points in the business are strong and which are weak.

Figures for comparison are listed throughout the workbook so that the farm being analyzed can be compared with other farms in the State. There are four groups with which comparison can be made. They include the averages from records on (a) 138 farms with less than 30 cows, (b) 249 farms with 30-49 cows, (c) 81 farms with 50 cows and over, and (d) the top 10% of all these farms in terms of labor income.

These records (468 in total) are all from dairy farms where milk makes up most of the receipts. Any farms with large receipts from other sources such as eggs or apples were not used in this publication. Each of the 468 farmers whose records is used in the averages presented here was a cooperator in one of the Farm Management Projects that cover 38 counties in New York State.

A Farm Management Project is made up of a group of farmers in a county who want to learn how to be better managers and thereby improve their businesses. A project typically runs for three years. During this time, the farmers keep a record book and inventory with the help of the county agricultural agent. At the end of each year, the books are summarized and analyzed and a "county summary" is made up using the averages of the group. With this summary as a basis, meetings are held to help the co-operators analyze their business and to help them learn how to use this analysis in making sound management decisions. These projects are open to any commercial dairy farmer.

Sound management decisions are the crux of good management. This workbook is designed to help the farmer toward that goal. However, some important steps such as comparing alternatives and acting on the decision are beyond the scope of this publication. If a farmer wishes assistance in these matters, he should consult his county agricultural agent.

## PART I

## FINANCIAL SUMMARY OF THE FARM BUSINESS

There are many good reasons why farm records should be kept and summarized. Three reasons are (a) to determine the financial success of the business, (b) to form a basis for analyzing the business to find the weaknesses, and (c) for income tax purposes.

This summary outline is set up to satisfy the first two purposes. By filling in the following pages, the income from a year's operation of the farm can be determined. At the same time, one can study the averages of groups of farms to see how the particular farm being analyzed compares. The analysis outline in Part II is set up to use this summary as a basis for the measures to be calculated in determining the strength of various business factors.

A somewhat different summary is required for calculating farm income tax. Adjustments for this purpose are explained on page 56 of the Cornell Farm Account Book, and on the introductory page of the Cornell Farm Business Record.

FARM RECEIPTS  
468 New York Dairy Farms, 1963

Item	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
Milk sales	\$ _____	\$10,669	\$18,109	\$32,418	\$25,964
Livestock & poultry sold	_____	1,218	1,902	3,564	2,499
Egg sales	_____	9	12	5	--
Crop sales	_____	151	143	67	176
Miscellaneous*	_____	<u>738</u>	<u>875</u>	<u>1,256</u>	<u>1,098</u>
Total Cash Receipts	\$ _____	\$12,785	\$21,041	\$37,310	\$29,737
Increase in inventory	_____	<u>1,418</u>	<u>2,364</u>	<u>4,583</u>	<u>4,796</u>
TOTAL FARM RECEIPTS	\$ _____	\$14,203	\$23,405	\$41,893	\$34,533
-----					
Average price per cwt. of 3.7 milk sold	\$ _____	\$4.27	\$4.30	\$4.34	\$4.33

\* Includes work off farm, conservation payments, refunds, capital items sold, etc.

Farm receipts are made up of all the cash receipts plus increase in inventory. Milk sales made up approximately 86% of the total cash receipts and livestock and poultry sales average about 9% on the 468 farms used for comparison.

Increase in inventory is the amount that the end farm inventory exceeds the beginning farm inventory. It is due to expansion and is a usual occurrence in a "going" farm business. It may occur as a result of more cows, more machinery and equipment, additions to the real estate, or a better feed situation.

Increases in inventory due to expansion are considered as farm receipts. These items could have been sold and turned into cash receipts if a farmer wished to do so. Instead, the farmer decided to invest this in his business. Also, the costs of producing or acquiring these items are included in the farm expenses.

When total cash receipts or total farm receipts are compared with the group of similar farms, it gives an indication of the size of the business being studied. It does not, however, in any way indicate how successful the business is because the costs have not yet been studied.

The price of milk will vary somewhat in relation to the distance from market. Milk price is seldom responsible for the success or failure of a particular business in any one year. This is borne out by the fact that the high income farmers (top 10% by labor income) received an average of one cent less for their milk than those with 50 cows and over and only three cents more than those with 30-49 cows.

Notice that the prices given are for "cwt. of 3.7 milk sold." All milk is converted to 3.7% test so that the milk price can be compared with groups of other farms regardless of the butterfat level of the herd.

To convert the milk sold on a particular farm to 3.7% test, one must multiply the total pounds of milk sold by the conversion factor for his average test found in the table below.

\_\_\_\_\_ Total pounds milk sold  
 X \_\_\_\_\_ Conversion factor for your average test (see table)  
 \_\_\_\_\_ POUNDS OF 3.7% MILK SOLD

The price is calculated by simply dividing pounds of 3.7 milk sold by 100 to find cwt. of 3.7% milk and then dividing milk sales by this figure.

FACTORS FOR CONVERTING MILK TO 3.7% TEST

Average Test	Conversion Factor	Average Test	Conversion Factor	Average Test	Conversion Factor
3.0	.889	4.0	1.046	5.0	1.203
3.1	.905	4.1	1.062	5.1	1.219
3.2	.920	4.2	1.077	5.2	1.234
3.3	.936	4.3	1.093	5.3	1.250
3.4	.952	4.4	1.109	5.4	1.266
3.5	.968	4.5	1.124	5.5	1.282
3.6	.984	4.6	1.140	5.6	1.297
3.7	1.000	4.7	1.156	5.7	1.313
3.8	1.015	4.8	1.172	5.8	1.329
3.9	1.030	4.9	1.187	5.9	1.344

## SUMMARY

4

FARM EXPENSES  
468 New York Dairy Farms, 1963

Item	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
Hired labor	\$ _____	\$ 295	\$ 1,031	\$ 2,967	\$ 1,707
Dairy concentrate	_____	3,319	5,644	10,794	7,445
Other feed	_____	168	241	753	422
Machine hire	_____	80	125	157	120
Machinery repairs	_____	444	721	1,288	878
Auto expense (farm share)	_____	140	146	245	150
Gas and oil	_____	502	680	1,137	770
Breeding fees	_____	159	222	337	283
Veterinary, medicine	_____	162	275	446	404
Milk hauling	_____	304	267	340	236
Other livestock expense	_____	336	603	1,077	775
Lime and fertilizer	_____	466	822	1,483	1,162
Seeds and plants	_____	141	226	361	279
Bale ties	_____	69	89	109	88
Spray, other crop expense	_____	35	83	166	133
Land, bldg., fence repair	_____	200	353	695	431
Taxes, insurance	_____	560	816	1,409	1,093
Electricity (farm share)	_____	200	316	582	418
Telephone (farm share)	_____	53	63	112	68
Miscellaneous	_____	125	220	415	267
Total Cash Operating Expenses	\$ _____	\$ 7,758	\$12,943	\$24,873	\$17,129
New machinery	_____	1,154	2,061	3,196	2,363
New real estate	_____	523	611	1,543	1,024
Livestock purchases	_____	431	624	1,284	834
Unpaid labor	_____	325	402	419	380
Decrease in inventory	_____	--	--	--	--
TOTAL FARM EXPENSES	\$ _____	\$10,191	\$16,641	\$31,315	\$21,730

Most of the expenses listed on page 4 are self-explanatory but a few deserve additional comment.

Hired labor is the second largest single item of expense on many dairy farms. On the farms used for comparison, this item averaged approximately 9% of total cash operating expenses. Hired labor should include wages to all full-time employees, part-time employees, piece workers, any social security paid by the employer on his employees and the cost of board for any hired man boarded by the operator.

Dairy concentrate refers to any grain purchased for the dairy herd. Hay for the dairy and any feed for other livestock are entered in "other feed." On the farms used for comparison, dairy concentrate amounted to approximately 43% of the total cash operating expenses. Since the dairy concentrate expense is such a large item on most dairy farms, it can reduce the income on a farm considerably unless the feeding program is watched very carefully.

Land, building and fence repairs include not only those expenses of maintaining the farm buildings, etc., but also the cost of maintaining the operator's house. Since income for analysis purposes assumes that the operator has free use of a house and privileges, the cost of maintaining the house must be included in farm expenses.

Capital items including new machinery, new real estate, and purchased livestock are not part of total cash operating expenses but are included in total farm expenses. When entering capital items be sure to enter the full cost less any trade-in. If the value of the capital items purchased more than offset the depreciation on the farm inventory, there will be an increase in inventory. (See page 2.)

Unpaid family labor refers to work done by members of the family who are not paid cash wages. For the 468 farms used for comparison, this item was calculated by determining how many months of unpaid labor was performed on each farm and then this was charged to the business at \$150 per month.

Even though the operator does not pay cash for this labor, it is assumed that he would have to hire it if the family were not available. Therefore, in order to measure the success of the business and to compare a business with similar businesses, a charge must be included for unpaid labor.

Decrease in inventory is the result of the end farm inventory being smaller than the beginning inventory. In a farm business, a decrease in inventory may result if feed supplies are short due to a drought year, if the operator fails to buy enough machinery to maintain the machinery inventory or sells livestock without replacing it. A decrease in inventory once in a while is not uncommon, but if there is one each year for a number of years, it is an indication of a weak business.

LABOR INCOME  
468 New York Dairy Farms, 1963

Item	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
Total farm receipts (p. 2)	\$ _____	\$14,203	\$23,405	\$41,893	\$34,533
Total farm expenses (p. 4)	_____	10,191	16,641	31,315	21,730
Farm Income	\$ _____	\$ 4,012	\$ 6,764	\$10,578	\$12,803
Interest on average capital at 5%	_____	1,745	2,751	4,548	3,511
Labor Income per Farm	\$ _____	\$ 2,267	\$ 4,013	\$ 6,030	\$ 9,292
Number of operators	_____	140 (on 138 farms)	266 (on 249 farms)	110 (on 81 farms)	47 (on 47 farms)
LABOR INCOME PER OPERATOR	\$ _____	\$ 2,236	\$ 3,757	\$ 4,440	\$ 9,292

Several ways have been developed to measure the returns from a farm business. The measure selected at any one time will depend on the purpose for which it is to be used.

Labor income per operator is the amount left after paying all farm expenses and interest on capital. It is the best measure to use for comparing a particular farm business with others. At the same time, it presents a measure of income that the operator can use to compare his own earnings with those of a full-time hired man since it is the amount that the operator receives for his labor and management in addition to free use of a house and privileges. (Privileges include meat, milk, vegetables, etc. grown on the farm.)

Interest on capital investment at 5% is charged to the business because a successful business should return enough to pay interest on the capital invested as well as an income to the operator. To find "average capital," one must first add the end farm inventory to the beginning farm inventory and then divide this sum by two. To find the interest, this average capital must then be multiplied by 5%.

Number of operators refers to the number of full-time operators in each farm business. If the farm being studied is a single operator business, the labor income per operator would be the same as the labor income per farm. If, however, it is a two-man partnership, the labor income per farm would be divided by two.

By looking at the average labor income per operator on the three groups of farms, it is evident that size has an effect on income. Also, note that the high income farms made over twice as much as the large size group, demonstrating that size is only one ingredient of success.

The purpose of analyzing a farm business is to help locate the strengths and weaknesses of that business. With a knowledge of these strengths and weaknesses, a farm manager is in a better position to make economic changes or adjustments in his business.

Weaknesses in dairy farm businesses are indicated by the variability in income on the 468 dairy farms analyzed in 1963. According to the table below over 1/4 of the farmers received a labor income of \$5,000 or more. At the same time, 10% had a minus income. By analyzing the businesses, it is possible to find the causes for this variability. By analyzing his own business, an operator can find what is limiting his income.

LABOR INCOME DISTRIBUTION  
468 New York Dairy Farms, 1963

Labor income per operator	Number of farms	Percent
\$7,500 and over	37	8
\$5,000 to \$7,499	91	20
\$2,500 to \$4,999	169	36
0 to \$2,499	123	26
Minus return	48	10

When analyzing a dairy farm business, the points that are looked at are called business factors. There are many business factors that affect the business but it has been found that there are four in dairy business that exceed all others in their importance. They are:

- (a) Size
- (b) Rates of production
- (c) Labor efficiency
- (d) Cost control

Each one of these factors can be measured in a number of ways. Part II offers (a) a guide for calculating the measures and (b) the averages for these measures on the 468 dairy farms for comparison purposes.

Decision making is the final and most important step up the stairs of farm business management. If a decision is to be a sound one, it must be based on an analysis of good farm records.

Besides the guides and comparison for analysis, Part II also offers other items of importance in making sound management decisions. They include consideration of the financial situation, goals and objectives, and a guide for budgeting.

In making major decisions, a manager must always consider what he has to work with (his resources). Most of the items in the table on page 8 are measures of physical or capital resources as well as measures of size.

MEASURES OF SIZE OF BUSINESS  
468 New York Dairy Farms, 1963

Measure	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
<u>Livestock (number)</u>					
Av. no. of cows	_____	24	38	67	50
Av. no. of heifers	_____	16	23	39	28
<u>Crops (acres)*</u>					
Hay	_____	52	70	100	79
Grass silage	_____	14	16	31	25
Corn silage	_____	10	17	29	20
Corn for grain	_____	8	12	15	14
Oats	_____	11	16	23	20
Total acres in crops	_____	73	106	154	121
<u>Labor</u>					
Man equivalent	_____	1.3	1.7	2.5	1.8
Total work units	_____	339	520	871	652
<u>Production</u>					
Lbs. of 3.7 milk sold	_____	249,600	421,200	747,300	599,300
<u>Capital (end inventory)</u>					
Machinery & equipment	\$ _____	\$ 7,677	\$12,163	\$18,015	\$14,137
Livestock	_____	8,505	14,149	25,033	19,119
Feed & supplies	_____	2,522	3,968	6,558	5,364
Land & buildings	_____	16,913	25,913	43,637	33,994
Total Investment	\$ _____	\$35,617	\$56,193	\$93,243	\$72,614

\* Average of number reporting.

Size of business is a very important factor in making a high income. In general, larger businesses make larger incomes. However, some businesses with 25 cows make larger incomes than others with 80 cows. A farm should be large enough to make efficient use of the machinery and regular labor force. To increase size beyond this point can be profitable if the other factors of management are also strong. If the other factors are weak, an increase in size may result in a decrease in income.

It is apparent in the table on page 8 that size can be measured in many ways. Which measure is most useful depends on the type of farm being studied and the purpose of the study.

Average number of cows is the best measure to use when studying the effect of size on labor income in dairy businesses. The table below illustrates how, in general, larger businesses make larger incomes. Note, however, that the 50-59 cow group had a lower average income than the 40-49 cow group. This may be partly due to the fact that many farms in this size range have recently expanded and in so doing have invested in new housing and equipment. Since much of this new equipment could handle 75-100 cows as easily as 50, it is being used somewhat inefficiently.

COWS PER FARM AND LABOR INCOME  
468 New York Dairy Farms, 1963

<u>Number of cows</u>	<u>Number of farms</u>	<u>Labor income per operator</u>
Under 20	28	\$1,110
20 - 29	110	\$2,550
30 - 39	153	\$3,470
40 - 49	96	\$4,410
50 - 59	42	\$3,860
60 & over	39	\$5,580

Total acres in crops is an important factor to be aware of when expanding the herd but is seldom used as a measure of size for dairy farms.

Labor is another measure of size and is especially important when comparing different types of business. Man equivalent is the amount of labor performed on the farm during the year in terms of full-time men. If an operator spends full time on his farm, hires four months additional labor, and his family puts in an equivalent of two months, there is a total of 18 months labor or 1.5 man equivalent.

Total productive man work units represents the number of days that would be required, under average conditions, to care for the acreage of crops grown and the number of livestock kept on the farm. A list of the work units required for each crop and kind of livestock is available in the back of the Farm Account Book, the Farm Business Record and at your county agricultural agent's office.

Pounds of 3.7 milk sold is another measure of size and is also an important figure in studying rates of production, labor efficiency, and cost control. Calculation of this item is given on page 3.

Capital investment indicates size and is very important when studying the financial situation. The capital investment in the table on page 8 is the total of the end farm inventory.

ANALYSIS  
RATES OF PRODUCTION

MEASURES OF RATES OF PRODUCTION  
468 New York Dairy Farms, 1963

Measure	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
Pounds of 3.7 milk sold per cow	_____	10,400	11,100	11,200	12,000
Milk sales per cow	\$ _____	\$445	\$477	\$484	\$519
Tons hay per acre	_____	2.1	2.3	2.5	2.6
Tons corn silage per acre	_____	11	13	13	15
Bushels of oats per acre	_____	52	60	55	62

MILK SOLD PER COW AND LABOR INCOME  
468 New York Dairy Farms, 1963

Pounds milk sold per cow	Farms with less than 30 cows		Farms with 30-49 cows		Farms with 50 cows and over	
	Number of farms	Labor income	Number of farms	Labor income	Number of farms	Labor income
Under 10,000	62	\$1,460	70	\$2,400	22	\$3,220
10,000-11,999	41	\$2,630	89	\$3,590	30	\$4,710
12,000 & over	35	\$3,240	90	\$5,180	29	\$5,770

High rates of production are one of the most important ingredients of a successful farm business. Few farmers have reached that point where the additional inputs necessary to raise the rates of production will not pay off.

Pounds of 3.7 milk sold per cow is the most important of the measures listed above for the dairyman since milk is the primary source of income. Cow production is calculated simply by dividing the total pounds of 3.7 milk sold by the average number of cows (both of these items are on page 8).

The high income group of farms had better production for each item listed. This difference was particularly significant for milk sold per cow with the high income group exceeding the median group by 1,000 pounds per cow.

The effect of production rate, specifically milk per cow, on labor income is illustrated above. In each of the three size groups, the farms with high production had an average labor income considerably higher than those with low production. It also illustrates what was previously mentioned about improving the other factors of management before expanding the size of business. When comparing the 30-49 cow group to the 50 and over group at the low production level (under 10,000) there is an increase of \$820 in labor income. However, when comparing the low producing group to the high producing group within the 30-49 cow group, there is an increase of \$2,780.

MEASURES OF LABOR EFFICIENCY  
468 New York Dairy Farms, 1963

Measure	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
Number of cows per man		18	22	27	28
Pounds of 3.7 milk sold per man		192,000	247,800	298,900	332,900
Work units per man		261	306	348	362
Crop acres per man		56	62	62	67

POUNDS OF MILK SOLD PER MAN & LABOR INCOME  
468 New York Dairy Farms, 1963

Pounds milk sold per man	Farms with less than 30 cows		Farms with 30-49 cows		Farms with 50 cows and over	
	Number of farms	Labor income	Number of farms	Labor income	Number of farms	Labor income
Under 250,000	118	\$1,880	114	\$2,400	20	\$3,100
250,000-349,999	20	\$4,500	108	\$4,630	47	\$4,460
350,000 & over	0	--	27	\$6,650	14	\$7,710

Labor efficiency is becoming increasingly important on farms. This is in part due to the rapidly rising wage rates relative to machinery prices and partly due to increasing rate of technological change on farms. If a farmer wants top efficiency from his hired men's time as well as his own, he must keep a close eye on all the factors that effect labor efficiency.

The measures of labor efficiency listed above are all calculated by dividing each item (cows, total work units, etc.) by the man equivalent. All of these items are listed on page 8.

Good labor efficiency is much more prevalent in large businesses as is shown in the table at the top of this page. The large farms (50 cows and over) averaged 9 more cows per man and over 100,000 more pounds milk per man than the farms with less than 30 cows. The better efficiency on the large farms is partly due to the use of expensive labor saving equipment that cannot be justified on small farms (example: milking parlor) and partly due to opportunities for division of work load, and flexibility of the labor force on the large farms, not possible on a one-man operation.

When labor efficiency is related to labor income as in the table above, two factors become obvious. One is that on the average farms with high efficiency, specifically pounds of milk sold per man, have higher incomes. This is illustrated in all three size groups. The other factor is that a much higher percentage of the large farms have high labor efficiency. Seventeen percent of the farms with 50 cows or over sold 350,000 pounds or more milk per man while only 11% of the medium-size group and none of the small-size group accomplished this.

ANALYSIS  
COST CONTROL

ITEMS RELATED TO FEED COSTS  
468 New York Dairy Farms, 1963

Item	My farm	Average of farms with:			Average of top 10% of labor income
		Less than 30 cows	30-49 cows	50 cows & over	
<u>Purchased feed</u>					
Dairy feed bought (grain only)	_____	\$3,319	\$5,644	\$10,794	\$7,445
Feed bought per cow	_____	\$138	\$149	\$161	\$149
Feed bought as % of milk receipts	_____	31%	31%	33%	29%
Feed bought per cwt. of milk sold	_____	\$1.33	\$1.34	\$1.44	\$1.24
<u>Roughage harvested (hay equivalent)</u>					
Hay (tons)	_____	109	159	252	208
Corn silage (tons ÷ 3)	_____	38	73	121	97
Other silage (tons ÷ 3)	_____	<u>28</u>	<u>39</u>	<u>54</u>	<u>51</u>
Total tons hay equivalent	_____	175	271	427	356
Tons hay equivalent per cow	_____	7.3	7.1	6.4	7.1
<u>Other considerations</u>					
Total acres in crops per cow	_____	3.0	2.8	2.3	2.4
Lime & fertilizer expense per cow	_____	\$19	\$22	\$22	\$23
Lime & fertilizer expense per crop acre	_____	\$6.38	\$7.75	\$9.63	\$9.60
Number of heifers per 10 cows	_____	6.7	6.1	5.8	5.6

Cost control is more difficult to measure than the other factors that have been calculated. This is due in part to the number of expenses in a farm business and their interrelationship. For example, machine cost per cow is dependent on a number of other factors so there is no "best" figure for all farms. Another reason why cost control is difficult to measure is that costs can be too low as well as too high. In an attempt to control costs, it is not difficult to cut costs to the point that they reduce efficiency.

Even though cost control is somewhat difficult to measure, it is very important that it be measured because it is apt to be the weakest factor, especially on farms that are expanding rapidly. The operator gets so busy with the extra physical work involved in expansion that he is apt to neglect his records so loses track of his costs.

Some of the more important costs are measured and discussed here. For each farm being analyzed, the one doing the analysis should decide whether the particular cost being studied is in line or not, first by comparing his figure with the average of the group of similar farms and then by considering the influence of the "other considerations" as they pertain to his farm.

Feed cost is the largest single expense on most dairy farms. It is directly influenced by the amount of home grown grain, quality of roughage, and number of youngstock. The table on page 12 illustrates how to measure feed costs as well as the other items that should be considered in determining the strength of the feeding program.

Feed bought as percent of milk receipts is one of the best measures for looking at feed cost. It is calculated by dividing dairy feed bought by milk sales (page 2). On the "typical" New York dairy farm where most of the roughage but little of the grain is produced on the farm, this measure averages about 30%. Some farms that grow little or no grain, harvest plenty of high quality roughage, and watch their feeding program closely keep this figure around 25% and still maintain a high herd production.

This measure is most useful in locating farms with high feed costs. On most farms where the percentage of milk receipts for feed exceeds 45%, the labor income is well below average.

PERCENT PURCHASED FEED IS OF MILK RECEIPTS  
468 New York Dairy Farms, 1963

Feed bought as percent of milk receipts	Farms with less than 30 cows		Farms with 30-49 cows		Farms with 50 cows and over	
	Number of farms	Labor income	Number of farms	Labor income	Number of farms	Labor income
Under 25%	36	\$2,420	52	\$4,690	9	\$3,710
25-34%	53	\$2,710	122	\$4,130	32	\$4,780
35-44%	34	\$1,910	59	\$3,000	36	\$5,060
45% & over	15	\$1,040	16	\$1,820	4	\$2,820

The table above illustrates generally how percent purchased feed is of milk receipts relates to labor income. There are a number of farms included here, however, that grow much or all of their own grain. Most farms of this kind fall, of course, in the "under 25%" group. The important point illustrated above is the way income falls off when the percent of the milk receipts going for feed exceed 45%.

The high income on the large farms in the 35-44% range looks out of place. However, upon further analysis it was found that this group had the lowest average crop acres per cow so many were substituting grain for hay.

ANALYSIS  
COST CONTROL

POWER AND MACHINERY COST\*  
468 New York Dairy Farms, 1963

Item	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
Beginning inventory	\$ _____	\$7,484	\$11,638	\$16,986	\$13,424
New machinery bought	_____	<u>1,154</u>	<u>2,061</u>	<u>3,196</u>	<u>2,363</u>
Total (No. 1)	\$ _____	\$8,638	\$13,699	\$20,182	\$15,787
End inventory	\$ _____	\$7,677	\$12,163	\$18,015	\$14,137
Machinery sold	_____	<u>36</u>	<u>62</u>	<u>97</u>	<u>92</u>
Total (No. 2)	\$ _____	<u>\$7,713</u>	<u>\$12,225</u>	<u>\$18,112</u>	<u>\$14,229</u>
Depreciation (Total No. 1 minus Total No. 2)	\$ _____	\$ 925	\$1,474	\$2,070	\$1,558
Interest at 5% average inventory	_____	379	595	875	689
Gas and oil	_____	502	680	1,137	770
Machinery repairs	_____	444	721	1,288	878
Bale ties	_____	69	89	109	88
Milk hauling	_____	304	267	340	236
Machine hire	_____	80	125	157	120
Auto expense (farm share)	_____	140	146	245	150
Electricity (farm share)	_____	<u>200</u>	<u>316</u>	<u>582</u>	<u>418</u>
Total power and machinery cost	\$ _____	\$3,043	\$4,413	\$6,803	\$4,907
Less:					
Gas tax refund \$ _____		\$92	\$130	\$193	\$134
Income from machine work _____		<u>85 177</u>	<u>89 219</u>	<u>69 262</u>	<u>117 251</u>
NET POWER AND MACHINERY COST	\$ _____	\$2,866	\$4,194	\$6,541	\$4,656
Net machinery cost per cow	\$ _____	\$119	\$110	\$98	\$93
Net machinery cost per crop acre	\$ _____	\$39	\$40	\$42	\$38
Net machinery cost per cwt. milk sold	\$ _____	\$1.15	\$1.00	\$ .88	\$ .78

\* Does not include insurance, housing, or value of labor used in operation or repair.

Power and machinery costs when all added together, make up a large part of the total expenses on the farm. These expenses are becoming increasingly important on the farm as more and more labor is replaced by machinery. At the same time, these costs can easily get out of line partly because they are made up of so many small expenses and partly because many farmers fail to recognize depreciation and obsolescence as a very real expense to the dairy business.

The table on page 14 is a guide for calculating the net power and machinery cost. This cost, of course, varies with size but when it is divided by average number of cows, crop acres, or total pounds of 3.7 milk sold, it can be compared to other farms.

Even when net machinery cost is put on "per cow" basis, size of farm has its influence as is illustrated by the size of this item on the three size groups of farms. Net power and machinery cost per cow averaged \$21 less on the large farms than on the small farms. The reason it is apt to be lower on large farms is that many pieces of machinery that are needed for a 30-cow dairy would serve just as well for a 60-cow dairy. Therefore, the machinery on large farms is apt to be used much more efficiently.

When machinery cost is related to labor income as is illustrated in the table below, it is obvious that this cost does have an influence on labor income, especially when it goes over \$140 per cow. High machinery costs seem to affect income adversely at a lower level on large farms than on small ones. This may be due to the fact that since it is easier to lower machinery cost per cow on a large farm by more efficient use, a large farm with high machinery cost per cow indicates serious weakness.

MACHINERY COST PER COW AND LABOR INCOME  
 468 New York Dairy Farms, 1963

Item	<u>Farms with less than 30 cows</u>		<u>Farms with 30-49 cows</u>		<u>Farms with 50 cows and over</u>	
	Number of farms	Labor income	Number of farms	Labor income	Number of farms	Labor income
Under \$100	42	\$2,640	93	\$4,580	49	\$5,270
\$100-\$139	65	\$2,800	121	\$3,530	29	\$3,980
\$140 & over	31	\$ 600	35	\$2,850	3	\$2,000

Note that the group of farms with less than 30 cows in the "under \$100" range have a lower average income than those in the next higher range. This may be a result of some small farm operators attempting to hold these costs down by using old and obsolete machinery and then trying to make up for its inefficiency by using more labor. Often when this is the case, the costs due to the inefficiency more than offset the savings on machinery costs. Again, costs must be kept in line but not reduced to the point that they reduce efficiency.

ANALYSIS  
COST CONTROL

LABOR AND MACHINERY COST  
468 New York Dairy Farms, 1963

Item	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
Net power & machinery cost (p. 14)	\$ _____	\$2,866	\$4,194	\$ 6,541	\$ 4,656
Value of operator's labor*	_____	3,652	3,845	4,889	3,600
Hired labor (p. 4)	_____	295	1,031	2,967	1,707
Unpaid family labor (p. 4)	_____	325	402	419	380
<b>TOTAL LABOR AND MACHINERY COST</b>	<b>\$ _____</b>	<b>7,138</b>	<b>9,472</b>	<b>\$14,816</b>	<b>\$10,343</b>
-----					
Labor and machinery cost per cow	\$ _____	\$297	\$249	\$221	\$207
Labor and machinery cost per crop acre	\$ _____	\$98	\$89	\$96	\$85
Labor and machinery cost per man	\$ _____	\$5,491	\$5,572	\$5,926	\$5,746
Labor and machinery cost per cwt. milk sold	\$ _____	\$2.86	\$2.25	\$1.98	\$1.73

\* \$3,600 per year. Multiply this by the number of operators on your farm.

LABOR & MACHINERY COST PER COW AND LABOR INCOME  
468 New York Dairy Farms, 1963

Cost per cow	Farms with less than 30 cows		Farms with 30-49 cows		Farms with 50 cows and over	
	Number of farms	Labor income	Number of farms	Labor income	Number of farms	Labor income
Under \$250	26	\$2,720	134	\$4,620	63	\$5,110
\$250-\$349	87	\$2,590	106	\$2,960	18	\$3,200
\$350 & over	25	\$730	9	\$2,200	0	--

Since the only economic justification for machinery generally, is to save labor, the measure of labor and machinery cost is a good one to use in sizing up a farm's machinery situation. If an operator adds an expensive machine to his business without expanding size or reducing the labor force, the result is inefficiency.

When labor and machinery cost per cow is related to labor income (see table above) it is obvious that as this cost increases labor income decreases. This relationship is even more apparent than that shown when machinery cost per cow alone was related to labor income.

MEASURES OF CAPITAL EFFICIENCY  
468 New York Dairy Farms, 1963

Measure	My farm	Average of farms with			Average of top 10% by labor income
		Less than 30 cows	30-49 cows	50 cows & over	
Total capital per man	\$ _____	\$27,398	\$33,055	\$37,297	\$40,341
Total capital per cow	\$ _____	\$1,484	\$1,479	\$1,392	\$1,452
Total capital per cwt. of milk sold	\$ _____	\$14	\$13	\$12	\$12
Total machinery and equipment per cow	\$ _____	\$320	\$320	\$269	\$283

CAPITAL PER COW AND LABOR INCOME  
468 New York Dairy Farms, 1963

Total capital per cow	Farms with less than 30 cows		Farms with 30-49 cows		Farms with 50 cows and over	
	Number of farms	Labor income	Number of farms	Labor income	Number of farms	Labor income
Under \$1,200	38	\$2,449	59	\$4,213	22	\$4,761
\$1,200-\$1,599	55	\$2,594	116	\$3,915	41	\$4,233
\$1,600 & over	45	\$1,688	74	\$3,384	18	\$5,628

Capital efficiency is a far more important factor on farms today than many people seem to realize. This is because dairy farming requires an ever increasing amount of capital. However, capital like all other costs to the business, can get out of line. This may result from too much money tied up in non-productive capital such as a very expensive house, an unnecessarily expensive barn, or a barn that is only half full of cows. Since every dairy farm has some unproductive capital, and since the capital used in production has a wide range as to its degree of efficiency, it is somewhat difficult to compare capital efficiency on a particular farm with similar farms in the State. It can be done, however, if the one studying the farm takes into consideration the other factors that influence capital efficiency.

When calculating the various measures of capital efficiency in the table above, use the end inventory figures found on page 8.

When capital per cow is related to labor income, there is a different relationship for each size group. On the small farms, capital per cow shows no significant influence on labor income until this item goes over \$1,600. The influence in this range may be partly due to amount of unproductive capital included. Usually on small farms, a higher percentage of the total capital is tied up in the operator's home. On the 30-49 cow farms, there is very little relationship but the table does indicate that high capital costs have some adverse effect on income. In the 50 and over cow group, the farms with high capital cost made the high incomes. This is primarily due to two factors. First, on large farms, a high percentage of the total capital is capital used in production. Second, a large amount of the capital on many of these farms is in the form of new and efficient buildings and machinery such as free stall housing, milking parlors, new silos with bunk feeders, etc. It is factors such as these that must be considered when studying capital efficiency on a particular farm.

FARM BUSINESS CHART FOR FARM MANAGEMENT COOPERATORS  
468 New York Dairy Farms, 1963

No. of cows	Total work units	Size		Rates of Production		
		Man equivalent	Pounds 3.7 milk sold	Pounds 3.7 milk sold per cow	Tons hay per acre	Tons corn silage per acre
79	1,044	3.1	888,700	14,000	4.0	23
52	720	2.3	610,700	13,000	3.2	18
45	617	2.1	511,400	12,400	2.9	15
41	556	1.9	454,700	11,800	2.6	14
37	512	1.7	416,700	11,200	2.4	13
-----						
34	475	1.5	373,600	10,700	2.1	12
31	429	1.4	329,000	10,100	2.0	11
28	387	1.3	288,800	9,500	1.9	10
25	343	1.2	241,300	8,800	1.6	9
19	211	1.0	169,100	7,200	1.2	6

Cows per man	Labor Efficiency		Cost Control			
	Pounds 3.7 milk sold per man		Feed bought per cow	% Feed is of milk receipts	Net machinery cost per cow	Labor and machinery cost per cow
34	400,400		61	16	63	175
29	326,500		91	22	79	203
26	294,700		109	26	89	219
24	273,300		123	28	96	232
23	252,800		140	30	103	246
-----						
21	232,100		152	32	111	261
20	210,000		165	34	118	272
19	190,300		182	37	127	289
17	168,300		202	41	141	313
14	128,400		249	48	188	392

The Farm Business Chart on page 18 is an important tool in determining the strength or weakness of various business factors. It not only lets one compare a particular factor with the average but also shows how far above or below average each factor falls.

The top figure in each column is the average of the top 10% of the farms for that factor. The other figures in the column are "the next best 10%," etc. For example, when sorted on milk per cow, the 10% of farms with the highest production per cow averaged 14,000 pounds of 3.7% milk sold per cow. The 10% with the lowest production per cow averaged 7,200 pounds.

Take a pencil and draw a line through each column which will show where the particular farm being analyzed stands. Then list below the factors that are particularly strong and those that are particularly weak. With these important factors listed plus a consideration of the financial situation and goals and objectives, the manager is in a good position to start considering what changes should be made in the business.

STRONG POINTS:

---

---

---

WEAK POINTS:

---

---

---

ANALYSIS  
FINANCIAL SITUATION

A shortage of working capital in the farm business can be just as important a problem as a weakness in the other factors just studied. Therefore, good management in getting and using capital in a farm business is becoming very important. The first step to good financial management is a working knowledge of the financial situation. A few counties are beginning to summarize information on assets and debts of the cooperators. The financial situation is a key factor in planning for adjustments in a business.

FARM FAMILY ASSETS, 1962

Item	My farm	30 Farms Lewis Co.	20 Farms Jefferson Co.	Average 138 farms*
<u>Farm Assets</u>				
Machinery & equipment	\$ _____	\$11,636	\$14,556	\$12,485
Cattle	_____	12,977	14,686	15,177
Other livestock	_____	79	84	100
Feed & supplies	_____	3,462	3,968	4,476
Land & buildings	_____	<u>21,698</u>	<u>22,030</u>	<u>27,302</u>
Total Farm Assets	\$ _____	\$49,852	\$55,324	\$59,540
<u>Non-Farm Assets</u>				
Other real estate	\$ _____	\$ 98	\$ 1,002	\$ 679
Stocks & bonds	_____	762	289	1,052
Personal share of auto	_____	450	741	631
Cash value of life insurance	_____	1,230	1,496	1,963
Household goods	_____	2,957	2,330	2,422
Cash on hand and in checking account	_____	378	671	762
Savings accounts	_____	--	--	1,213
Investment in cooperatives	_____	506	134	1,157
Accounts receivable	_____	382	92	2,374
Other	_____	<u>--</u>	<u>--</u>	<u>159</u>
Total Non-farm Assets	\$ _____	\$ 6,763	\$ 6,755	\$12,412
TOTAL ALL ASSETS	\$ _____	<u>\$56,615</u>	<u>\$62,079</u>	<u>\$71,952</u>

\* Farm Credit Study, Cayuga, Delaware, Oneida, and Otsego Counties.

Feed and supplies are often not considered by lenders as "loanable assets" because they are stock-in-trade which is used up. Likewise, some non-farm items are not "loanable assets." Most lenders are reluctant to lend over 60 percent of the value of land and buildings, machinery, and livestock.

Most farmers use credit in some amount. Unless you are one of the very few who have no debts at all, the following table will help you to summarize your debts and compare them with those of other dairymen. You may already have the financial situation figures needed in your farm inventory record.

FARM FAMILY DEBTS AND NET WORTH, 1962

Item	My farm	30 Farms Lewis Co.	20 Farms Jefferson Co.	Average 138 farms*
<u>Debts</u>				
Real estate debt	\$ _____	\$10,781	\$14,906	\$11,144
Chattel mortgages on cattle and equipment	_____	4,673	2,404	7,544
Notes payable	_____	1,988	2,280	1,662
Installment contracts	_____	627	--	239
Other secured loans	_____	30	--	439
Feed, seed, etc. open accounts	_____	529	642	834
Other farm accounts payable	_____	1,063	--	487
Personal bills and accounts	_____	--	--	138
<b>TOTAL DEBTS</b>	<b>\$ _____</b>	<b>\$19,691</b>	<b>\$20,232</b>	<b>\$22,487</b>
<hr style="border-top: 1px dashed black;"/>				
Total assets	\$ _____	\$56,615	\$62,079	\$71,952
Total debts	_____	19,691	20,232	22,487
<b>NET WORTH</b>	<b>\$ _____</b>	<b>\$36,924</b>	<b>\$41,847</b>	<b>\$49,465</b>
% Equity	_____ %	65%	67%	69%
% Real estate debt is of total debt	_____ %	55%	74%	50%
Total Debt per Cow	\$ _____	\$505	\$450	\$562

\* Farm Credit Study, Cayuga, Delaware, Oneida, and Otsego Counties.

Net worth is the amount you own. Percent equity (net worth divided by total assets) is the percentage of your total assets that you own. Total debt per cow averages around \$500 per cow but varies widely. Below is an indication of the range in debt per cow on these farms.

How does your position compare with other dairymen?

<u>Debt per cow position</u>	<u>Check yours</u>
Less than \$300 - low	_____
\$300-\$600 - medium	_____
\$600-\$900 - high	_____
Over \$900 - very high	_____

If a farm has been analyzed according to the guidelines set up in this workbook, the one doing the analysis has no doubt found some weaknesses in the business that he feels should be corrected or improved. However, before making any corrections or improvements, some time should be spent in consideration of the goals and objectives of the operator and his family. These goals and objectives should have an important influence on any major change made in the business.

Goals for Your Farm and Family

The Farm -- List the major farm improvements you want to make in the next five years. The list should include changes in buildings, land, crops, and livestock.

---



---

The Home -- List major changes you want to make in the home in the next five years. Include remodeling, equipment, and furniture.

---



---

Family Security -- List things you want to get done relative to financial security. This list might include debt reduction, a better life insurance program, more business insurance, a will, plans for retirement.

---



---

Education -- List your objectives for educating the children.

---



---

Recreation -- List your plans for major vacations, trips, new cars, etc.

---



---

Better Working Conditions -- What do you hope to accomplish concerning the hours you work, lightening physical work, and the like?

---



---

The Community -- What do you hope to get done relative to making your community a better place to live - schools, church, roads, and so forth?

---



---

THREE YEAR COMPARISON OF FARM BUSINESSES  
New York Dairy Farms, 1961-63

Item	1961	1962	1963
Number of farms	490	503	468
<u>Financial summary</u>			
Average capital	\$53,722	\$53,541	\$55,304
Total farm receipts	\$22,505	\$21,351	\$23,891
Total farm expenses	\$16,125	\$16,406	\$17,278
LABOR INCOME per operator	\$3,352	\$2,019	\$3,492
<u>Size</u>			
Number of cows	38	38	39
Total crop acres	99	101	105
Man equivalent	1.8	1.8	1.7
Total work units	516	524	527
Lbs. of milk sold	378,700	394,900	427,000
<u>Rates of production</u>			
Lbs. milk sold per cow	9,970	10,390	10,950
Tons hay per acre	2.6	1.8	2.3
Tons corn silage per acre	12	12	12
Bu. oats per acre	50	50	57
<u>Labor efficiency</u>			
Number cows per man	21	21	23
Work units per man	287	291	310
Lbs. of milk sold per man	210,400	219,400	251,200
<u>Cost control factors</u>			
% Feed is of milk receipts	28%	33%	32%
Labor & machinery cost per cow	\$256	\$253	\$249
<u>Prices</u>			
Av. price per cwt. milk	\$4.47	\$4.33	\$4.31

When changes are to be made on the farm in an attempt to correct the weaknesses and/or meet the family's goals and objectives, the manager should not base his decision on one year's record alone unless there is no other choice. If possible, he should have at least 3 years' records so as to determine a more accurate "normal figure" and to get some indication of the trends on his farm.

The purpose of the table above is to illustrate the importance of using more than one year's record for analysis and decision making. Notice hay yields were down in 1962 and "% feed is of milk receipts" was up. This was due to the drought conditions in that year.

When a farm manager considers making a change in his business, there are usually two or three alternative solutions to the problem. The outline below is a guide to help the farmer compare these alternatives. If the change is to be a major one, the farm manager may wish to consult with his county agricultural agent since he is experienced in the techniques of budgeting and has in his possession considerable reference material that is helpful when comparing alternatives.

	<u>My business in 1963</u>	<u>Proposed Change #1</u>	<u>Proposed Change #2</u>
<b>I. <u>Farm Receipts</u></b>			
Milk sales, gross	\$ _____	\$ _____	\$ _____
Livestock sales	_____	_____	_____
Egg sales	_____	_____	_____
Crop sales	_____	_____	_____
Miscellaneous receipts	_____	_____	_____
Total Cash Receipts	_____	_____	_____
Increase in inventory	_____	_____	_____
Total Farm Receipts	\$ _____	\$ _____	\$ _____
<b>II. <u>Farm Expenses</u></b>			
Hired labor	\$ _____	\$ _____	\$ _____
Dairy feed bought	_____	_____	_____
_____ feed bought	_____	_____	_____
Machine hire	_____	_____	_____
Truck, tractor, machinery	_____	_____	_____
Auto expense (farm share)	_____	_____	_____
Gasoline and oil	_____	_____	_____
Breeding fees	_____	_____	_____
Veterinary and medicine	_____	_____	_____
Other livestock, poultry exp.	_____	_____	_____
Lime and fertilizer	_____	_____	_____
Seeds and plants	_____	_____	_____
Spray, other crop expense	_____	_____	_____
Land, building, fence expense	_____	_____	_____
Taxes, insurance	_____	_____	_____
Electricity, telephone (f.s.)	_____	_____	_____
Miscellaneous	_____	_____	_____
Total Cash Operating Expenses	_____	_____	_____
New machinery	_____	_____	_____
New real estate	_____	_____	_____
Livestock purchases	_____	_____	_____
Unpaid family labor	_____	_____	_____
Decrease in inventory	_____	_____	_____
Total Farm Expenses	\$ _____	\$ _____	\$ _____
<b>III. <u>Farm Financial Summary</u></b>			
Capital Investment	\$ _____	\$ _____	\$ _____
Total Farm Receipts	\$ _____	\$ _____	\$ _____
Total Farm Expenses	_____	_____	_____
Farm Income	\$ _____	\$ _____	\$ _____
Interest on Capital	_____	_____	_____
LABOR INCOME	\$ _____	\$ _____	\$ _____

