

DAIRY FARM ORGANIZATION IN
BRITISH COLUMBIA

by

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1.

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2.

Part 1.

INTRODUCTORY

(1)

INTRODUCTION

On May 1st, 1920, the Department of Animal Husbandry of the University of British Columbia commenced its first survey of dairy farms in British Columbia. Every year since that date the work of collecting data from the dairy farmers of this province has been carried on. There were difficulties at first. The farmers did not understand the nature of the survey; the records which the farmers kept of their transactions were very incomplete; and there was some trouble in organizing the vast amount of detail which was accumulated. But year by year the records have become more complete and more accurate and consequently more valuable. From time to time reports have been published on the results obtained through the compilation of this data. Now, at the end of ten years, it was thought fitting that a study be made of the organization of the dairy farms which have been included in the survey.

When the Survey was first started the Department of Animal Husbandry had several objects in view. It was thought that the information obtained would give a true picture of the actual conditions of the dairy farming business. It would enable the Department to determine what factors in dairy farm organization, and what methods used by the farmers were responsible for the success or the failure which the dairy-men achieved. Moreover, it was thought that the records gained

in this manner would prove invaluable in the teaching work at the University.

To secure representative data, a group of farms was selected from each of the main dairying areas of the Province. In each district farms were chosen which varied in size and in prosperity. In this way a fairly reliable cross-section of the dairy-farming business of the Province was obtained. For the purpose of this thesis, 1745 farm records were used. This indicates that there has been an average of 174.5 farms included in the Survey each year. From time to time some farms have dropped out of the Survey and have been replaced by others. It is reasonable to assume, therefore, that the large number of farms used warrants confidence in the results of this summary. The actual work of obtaining and compiling the data may be described as follows:

Fieldmen are sent out by the University on the first of May each year. These men visit each of the farmers on the Survey and obtain from them complete information regarding the farm transactions during the crop year which has just ended. Besides this record of receipts and expenditures, notes are made of any change in the capitalization or inventories of the farm since the beginning of the last crop year. Certain personal information is also solicited. The data collected is entered in blank field forms by the fieldmen. To facilitate the compilation of the required information, the farmer is encouraged to keep accurate records of all his transactions by means

of farm account books which are sent to him, free of charge, by the University. When the fieldmen return to the University the information which they have obtained from the farmers is transferred to office sheets. These sheets are so arranged as to show a complete financial summary of the farm business, and the efficiency of the different factors of production. When the office sheets have all been completed, each farmer is sent a detailed financial report of his business along with corresponding figures for the average of all farms in his acreage group, and data from a typically successful farm of a similar size. It can be said, therefore, that the farmer is well repaid for his cooperation with the University.

(2)

EXPLANATION OF TERMS USED #Crop area:

"This is the acreage under cultivated crops. It does not include pasture acreage.

Total acres:

"This is the sum of the actual acres in the unit under consideration, be it farm or group.

Tillable area:

"As rough pasture and other untillable land add to the feeding capacity of a dairy-farm, they are considered in the tillable area. It is estimated that 3 acres of rough land, or 10 acres of pastured woods, would produce feed equal to one acre of arable land. To the arable land of the farm, therefore, is added one-third of the rough land and one-tenth of the area of pastured woods. The total is known as the tillable area.

Project:

"Each different source of income is called a project when the receipts from such source amount to 5 per cent. of the gross farm income.

Unit of man-labour:

"One man employed on the farm for twelve months is termed a unit of man-labour.

Unit of horse-labour:

"One horse kept on the farm for twelve months.

"Dairy-farming in British Columbia" - Hare, H.R. Bulletin
103, Department of Agriculture, Victoria, B.C.

'Diversity index:

This expresses the percentage of total farm receipts that are made up from one project.

'Animal unit:

A mature horse or cow kept on the farm for one year is recognized as an animal unit. All live stock kept on the farm is reduced to an animal unit basis by comparing the amount of feed that the different classes of animals consume with that consumed by a mature cow. For example, 100 hens, 7 sheep, 4 calves under one year of age, or 2 over 1 year, are treated as an animal unit when kept the whole year through. A brood sow is calculated as 0.3 units and growing pigs on the basis of increase of weight. A farm having 30 animal units would be one on which all the live stock would consume feed equal to the average consumption of 30 mature cows.

'Live-stock index:

This is the measure of the efficiency of live stock based on the gross receipts per animal unit. The average gross receipt per animal unit is set at 100. A farm having a live-stock index of 120 would be one where the receipts per animal unit were 20 per cent. above the average and a live stock index below 100 would represent live stock that gave a gross return per animal unit that was below the average.

Crop index:

By this index crop yields per acre are expressed. It is a means of comparing efficiency in the use of land devoted to crops. Average crop yields are set at 100. A farm having a crop index of 100 has crop yields that are equal to the average. Higher or lower crop indices would represent yields that are above or below the average.

Farm credits or perquisites:

Each dairyman uses in the household a certain amount of the products produced on his own farm. Such commodities are here credited to the farm and are recorded as farm sales. Milk so used and credited to the farm was valued at 6 cents per quart, butter at 40 cents per pound, beef and pork at current wholesale prices, eggs at 25 cents per dozen, and wood at \$2.50 per cord. Estimates were placed on the value of fruit and vegetables used in the house by the operator in consultation with the field enumerator at the time of his visit. The rental value of the farmer's dwelling was included as a receipt to the farm at the rate of 10 per cent. of the house valuation.

Operator:

The person who operates the farm. He may own or lease the land which he operates.

"Landlord:

The person who owns the farm but who has leased the property to another.

"Farm net revenue:

The farm net revenue is the balance of gross farm receipts after deducting all expense in connection with the operation of the farm. The gross receipts include receipts from the sale of all farm products, any increase of inventory values and farm credits, as explained above. The gross expense includes all actual cash expense excepting capital outlay; that is, expense in connection with new buildings or machinery. In addition to cash outlay, depreciation on buildings or machinery, and decrease in inventory values, along with a sum representing the value of the labor provided by members of the operator's family, are charged as expense. No wage to the operator is allowed in expense. In the case of partnership, the farm has been placed on a one-operator basis by including in expense the sum of \$720 per year as the partner's wage.

"Operator income:

The operator income is derived by deducting from the farm net revenue a sum to meet the interest charges on the operator's capital involved in the business. All calculations of this interest charge, except where noted, have been made

at the rate of 7 per cent. per annum.

In such cases as where interest on capital amounts to a greater sum than the farm net revenue, the "operator income" is represented as a minus (-) amount. In practice, it is quite possible for a farm business to yield a minus "operator income" and yet provide such a return that the operator may actually save money during the year. Expenses include items that may not actually have been paid. The operator, too, may own the capital which he uses, or a large portion of it, and need not pay interest on capital valuations.

One should not condemn a dairy-farm business on account of a minus "operator income" for one year. If, however, the business continues over a period of years to produce such an "operator income" it must be classed as a business failure.

The "operator income" is here used as a measuring-rod in comparing the efficiency in management of one farm business with that of another. It represents wages to the operator for his efforts in labour and management. Variations in "operator income" are due in many cases to unavoidable circumstances, but, over a period of years, they may be high or low, due to factors that come more or less under the farmer's control.

Real income:

This represents the sum of money which the farm operator

can extract from the business during any one year for living or other expenses without increasing his indebtedness to individuals outside his own family. In order that fair comparison be made in determining management efficiency, it has been necessary to place under "expense" several items that on some farms are not payed each year. Such items as family labour, board of labor, depreciation on buildings and equipment, and interest on operator's own capital fall into this group. By adding to the "operator income" the amount of these items we determine the possible real income for any year."

(3)

THE DISTRICTS FROM WHICH THE DATA WAS OBTAINED #

The topography of British Columbia is of such nature as to create a wide range of conditions of soil, climate, and market in the various agricultural areas of the Province. The districts that have made great progress in their dairy development have been confined, up to this time, to the Coast and southern sections. This region includes the southern portion of Vancouver Island bordering on the Strait of Georgia, the adjacent islands, the Lower Fraser Valley extending from Hope to the Coast, the Okanagan Valley, and the valleys extending along the lakes and rivers of the Kootenay district.

In this survey, groups of farms were selected from the following districts within the Province: Courtenay, Ladner, Chilliwack, the Okanagan Valley, Salmon Arm, and the Arrow Lakes. The climatic and soil conditions which prevail in the vicinity of Courtenay are typical of conditions in the dairying districts on Vancouver Island and on the Gulf Islands. Soils vary from a sedimentary deposit of the valleys to a gravelly glacial-drift type of soil of the uplands.

"Dairy Farming in British Columbia" - Hare, H.R.,
Bulletin 103, Department of Agriculture, Victoria, B.C.

The annual precipitation fluctuates around 40 inches; the greatest amount, occurring in December, averages 13 inches. This rainfall exceeds slightly that of the southern portion of Vancouver Island. Like most dairying districts of British Columbia, the summer rainfall is light, but is ample for good crop production when proper tillage is practised.

For the purpose of this study, the Courtenay district includes a few farms on Denman Island and farms within a radius of 6 miles of Courtenay itself.

A market for the milk produced in this area is provided by the Comox Creamery. This is a farmers' co-operative organization which makes butter and ice cream, handles a certain amount of whole milk, has a strong farm produce merchandizing organization which gives special attention to the marketing of eggs and potatoes, processes a certain amount of fruit, and retains a consumers' co-operative department which deals in machinery, feed, sugar, and flour.

The Ladner district, as here interpreted, includes farms located in the vicinity of the town of Ladner, incorporating the Delta, Lulu and Sea Islands, and the Mud Bay area.

The soil of this district is of a silt and clay nature, having been built up by sedimentary deposit at the mouth of the Fraser River. The whole of this area is flat and is protected by dykes from the sea and river overflow. The soil is rich and admirably suited to the production of most farm crops.

The Chilliwack district, for the purposes of this

thesis, includes that area in the upper part of what is known as the Lower Fraser Valley. It incorporates that area in ~~the~~ which is carried on dairying of a somewhat similar nature to that practised in the region of the City of Chilliwack. The district extends from Cloverdale to Rosedale. Dairying in this area is of a more intensive nature than that practised in the Ladner district.

The soil of the Chilliwack area is of older origin than that of Ladner. The low land is of a silt and clay nature, but, due to changes in the old river-bed, is streaked with gravel. The upland, of which there is considerable, is of glacial-drift origin and tends towards a gravelly loam. Most of the farms included in this survey are located on the lower land, which, on account of the abundant grass, is more suited to dairy-farming than the uplands.

The climate of the Courtenay, Ladner, and Chilliwack districts is very similar, being relatively mild throughout the year. Frosts, sufficient to stop ploughing operations, occur most years for a period of one or two weeks. The winter rains, however, interfere with work on the land at this season in all districts.

Vancouver City provides a market for most farm products grown in the Ladner and Chilliwack districts. The farmers included in this investigation were largely those who sold their dairy products through the Fraser Valley Milk Producers' Association. This organization is a farmers' co-operative

company which has done much to build up the dairying business of these districts.

"The Okanagan district includes farms in this valley extending from Kelowna at the south to Grindrod at the north and extending east from Vernon to Lumby. The soil varies from a heavy clay in the vicinity of Armstrong and north to a sandy silt and gravelly loam at Vernon and Kelowna. In the Lumby area a splendid silt-clay type of soil prevails on the bottom land, on which most of the dairy farms are located.

"The precipitation varies; it is heavier at Armstrong and Lumby than at Kelowna and Vernon. Kelowna has an average annual precipitation of about 12 inches, while at Vernon the rainfall is 2 inches greater. Irrigation is used for field crops to a considerable extent at Kelowna and to some extent at Vernon. Armstrong and Lumby appear to secure sufficient moisture without an artificial supply of water, but conservation of moisture is necessary for crop production.

"The seasons of the year are more clearly defined in the Okanagan than in the Fraser Valley. The summer is warmer and the winter colder in the interior district. Extreme cold, however, is unusual. Autumn frost prevents tillage of land until early spring.

"The market for the dairy products of the districts is largely provided by creameries. A certain amount of milk and cream is used in urban consumption. The creameries are located at Enderby, Armstrong, Vernon, and Kelowna. With the except-

ion of the Enderby plant, all~~are~~ are operated on a co-operative basis.

"The Salmon Arm district extends approximately 9 miles up the valley from Salmon Arm. For the most part it is a sedimentary bottom land capable of producing excellent crops.

"The precipitation averages 19 inches and is quite well distributed throughout the year. Such precipitation is sufficient for crop production, though good cultivation must be practised in order to conserve the moisture.

"The Salmon Arm Co-operative Creamery provides a market for the cream produced.

"In the Arrow Lakes district the area included in this study extends northwards along the narrow Arrow Lake Valley From Robson, at the south, to Nakusp. The soil varies from a sandy nature to clays and sedimentary bottom land. Most of the last-mentioned soil is found in the vicinity of Edgewood.

"The winter climate of this district is colder than in any other district studied. The summers are generally warm.

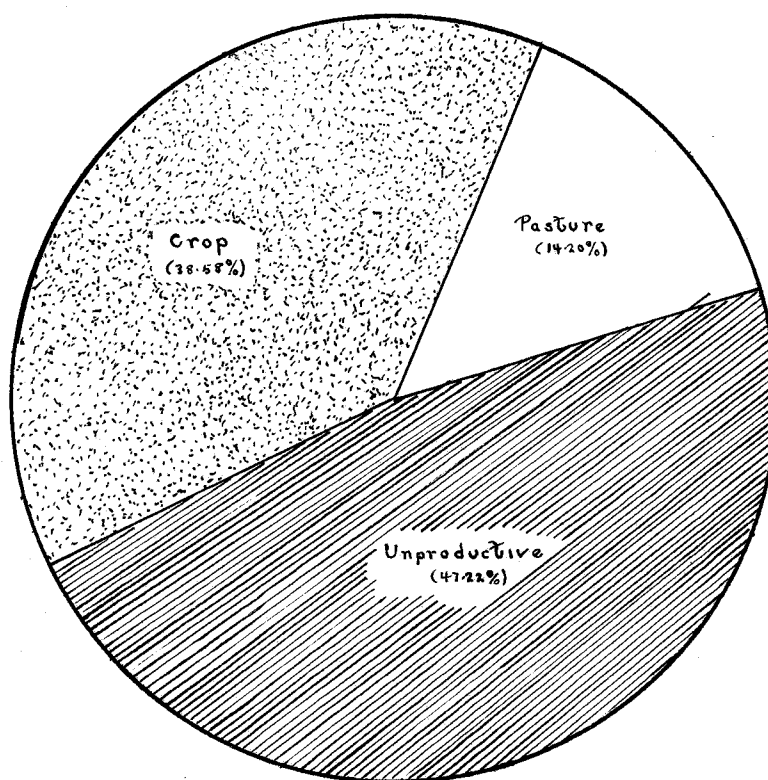
"The outlet for dairy products is provided by the Curlew Creamery at Nelson and also by a Swiss-cheese factory recently started at Edgewood.

"A certain amount of raw milk is sold for town and village consumption. The egg market is important, as the nearby active mining towns of Trail and Rossland have created a market for this product, which has greatly stimulated the poultry industry of this district during the past five years."

Part II

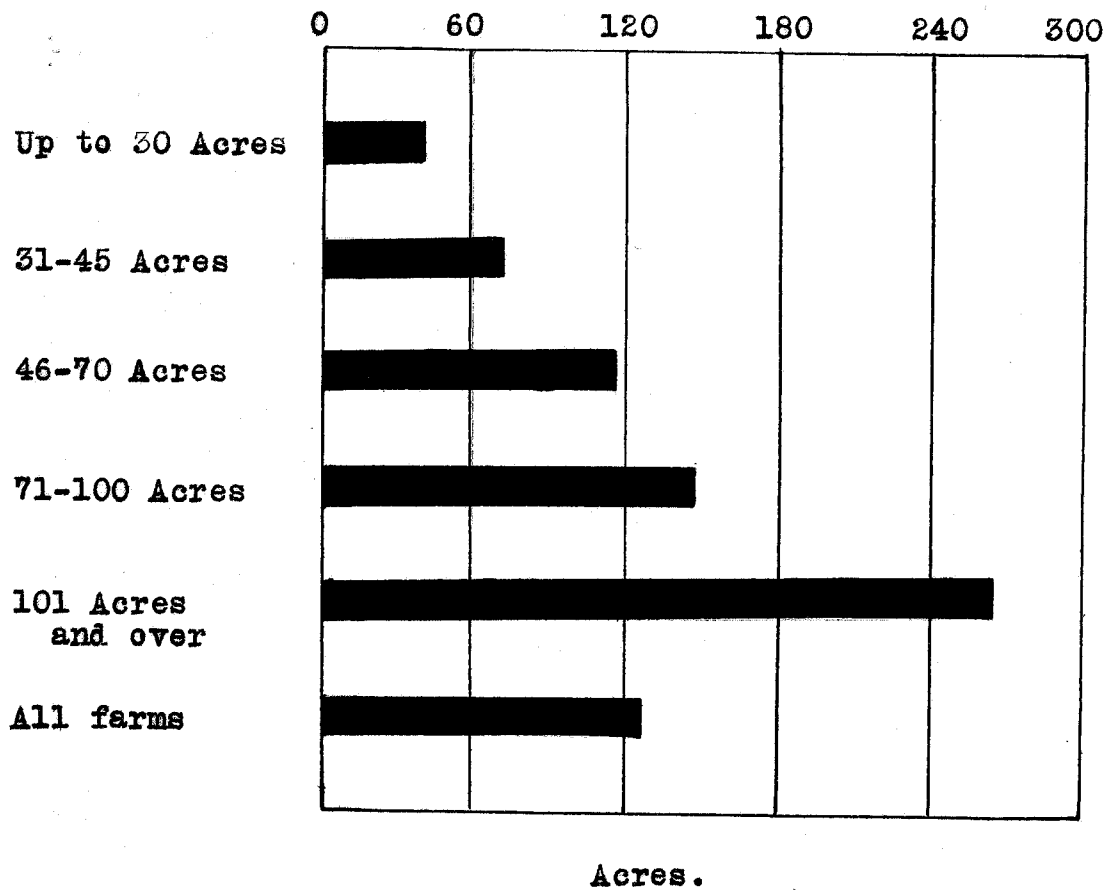
THE DAIRY FARMING BUSINESS IN
GENERAL

FIG. 1. AVERAGE DISPOSITION OF ACREAGE ON ALL
FARMS, 1921-30.



(From Table No. 2, Appendix.)

Fig. 2. AVERAGE ACTUAL ACRES, 1921-30.



(From Table No. 1, Appendix.)

(4)

AN ANALYSIS OF THE ACREAGE(a) The disposition of the acreage on all farms.

The average size of all farms included in the Survey was 139.66 acres. Of this total acreage, however, only 52.73 per cent. was productive. The remainder of the land was made up of woods, lanes, yards, marshes, and other unproductive land. The high percentage of this unproductive land is probably due to the fact that many of the farms in the interior of the Province have large areas of wooded land on them. The farms of the Fraser Valley have a relatively high percentage of tillable land to the total acreage. The total area was made up of 38.58 per cent. in crops and 14.20 per cent. in pasture, as well as the unproductive land.

(b) Total acreage.

As indicated in Fig. 2, the actual number of acres in the farms of each acreage group was much larger than the number of tillable acres in that group. In the case of each acreage group the actual acres in the farms of that group were practically double the number of tillable acres. It should be noted that the average size of farms in the group, 101 acres and over, was 287.97 acres. This large increase over the average size of the farms in the other groups will undoubtedly tend to emphasize the trends which are shown in the following

charts and tables.

(c) Tillable acres.

Of all the acreage groups, the one including farms from 46 to 70 acres had the lowest per cent. of tillable land ^{compared} to total acreage. The two smaller groups were also low. It was rather surprising to see that the largest-sized group had also the highest proportion of tillable acres.

(d) Crop acres.

The farms in the first three acreage groups had about the same proportion of land in crops, that is, from 33.92 to 34.69 per cent. The two larger groups, however, show a marked increase in the percentage of land devoted to crops. As the size of the farms increased more attention was paid to crops and less to livestock production, due to the necessity of adapting the labour supply to the size of the farm. This will be further illustrated when the number of ~~tillable~~ animal units per tillable acre will be considered.

(e) Tillable area of pasture.

The trend of area of land devoted to pasture was much similar to the trend for crops except that the two extreme size groups devote practically the same proportion of their land to pasture, that is, 14.32 and 15.47 per cent, while the center group was the low group in that it gave only 11.78 per cent. of

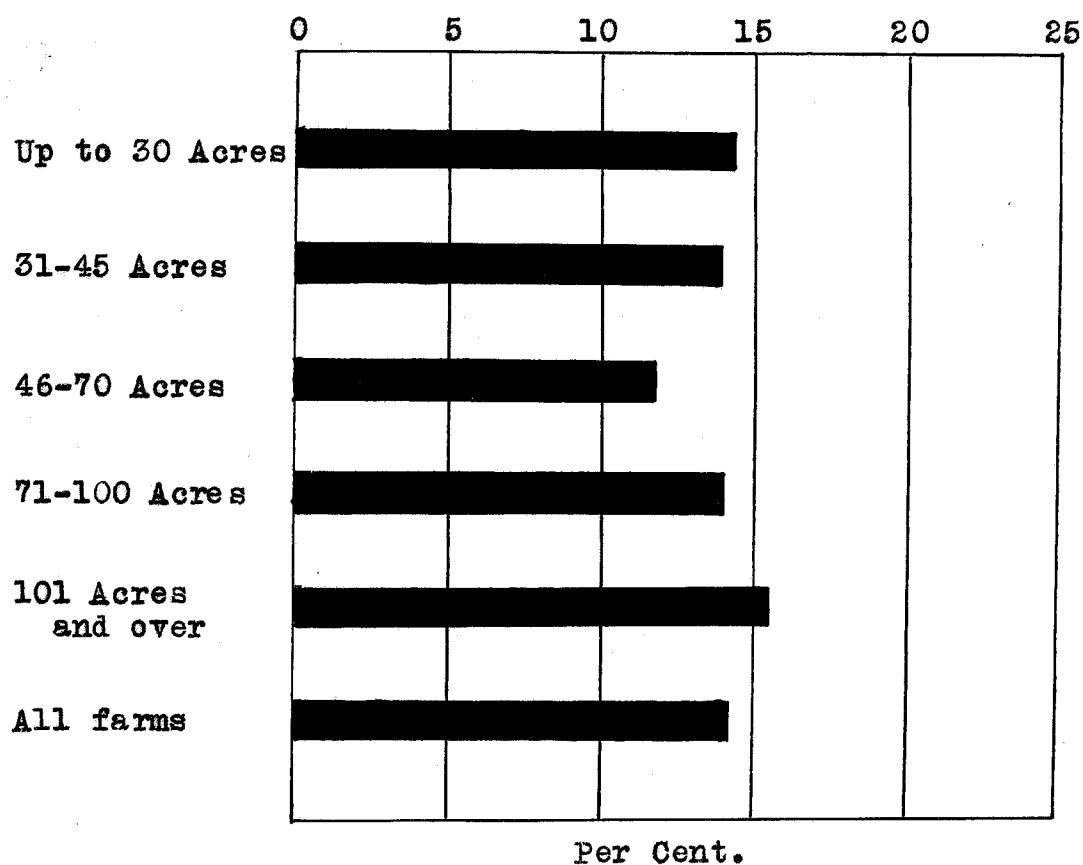
Fig. 3. AVERAGE PERCENTAGE OF TOTAL ACRES IN CROPS.

1921 - 1930.



(From Table No. 2, Appendix.)

**Fig. 4. AVERAGE PERCENTAGE OF TILLABLE AREA IN
PASTURE, 1921 - 30.**



(From Table No. 2, Appendix.)

its land to pasture. The similarity between the largest and smallest groups in this respect was probably due to the fact that there is a larger livestock population on the small farms, per acre, which tends to balance the more extensive use of the land for crops and pasture on the larger farms. The farms with 46 to 70 tillable acres appear to be an awkward size to handle. These farms cannot be efficiently devoted to either intensive livestock production or crop production.

(f) Unproductive land.

The above conclusion is strengthened when we find that the farms of from 46 to 70 tillable acres had the largest proportion of unproductive land. The smaller farms were only three or four per cent. better in this respect. It is the largest farms which can boast of the lowest proportion of unproductive land.

(g) Crop acres per man.

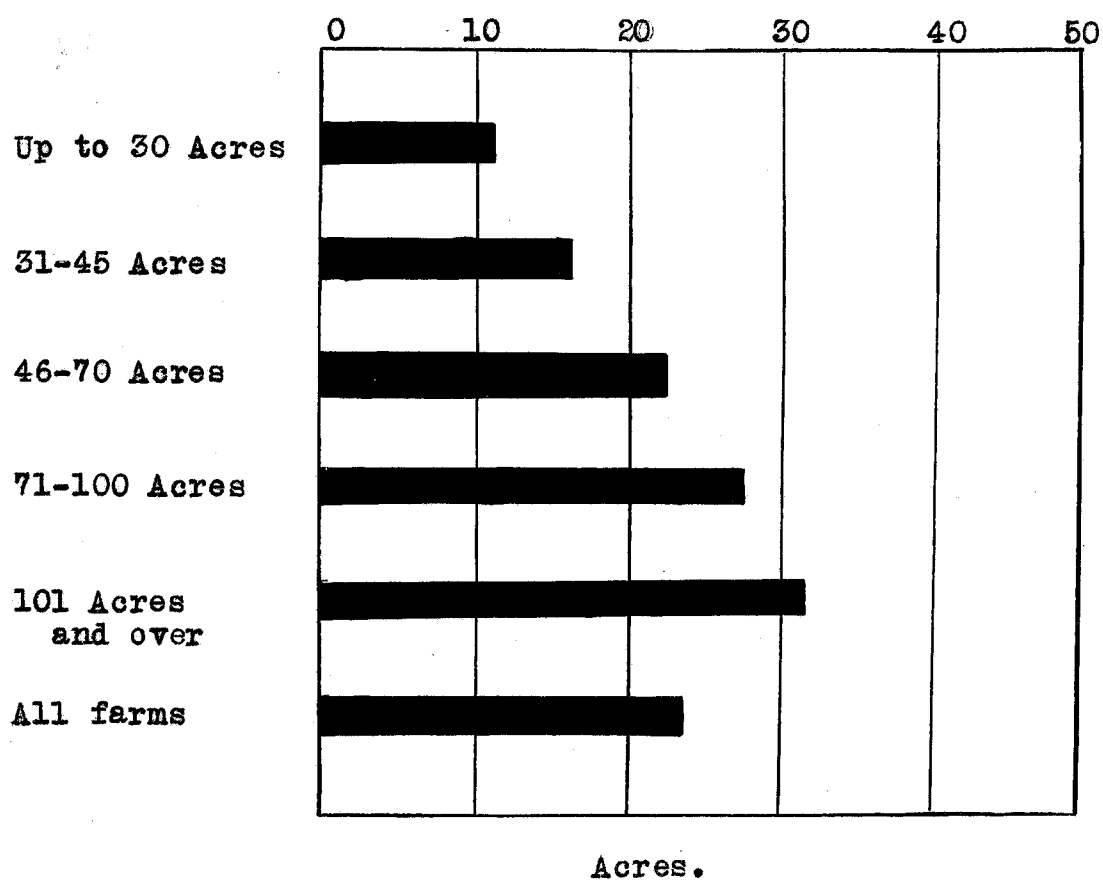
The number of crop acres per man is an indication of the degree of intensity with which labour is applied on the farms. Fig. 6 indicates clearly that as farms become larger, the amount of labour applied per acre diminishes. In other words, as the size of the farms increases, the type of agriculture practised becomes more extensive in nature.

Fig. 5. AVERAGE PERCENTAGE OF UNPRODUCTIVE LAND
1921 - 1930.



(From Table No. 2, Appendix.)

Fig. 6. AVERAGE ACTUAL CROP ACRES PER MAN, 1921-30.



(From Table No. 1, Appendix.)

(h) Crop acres per horse

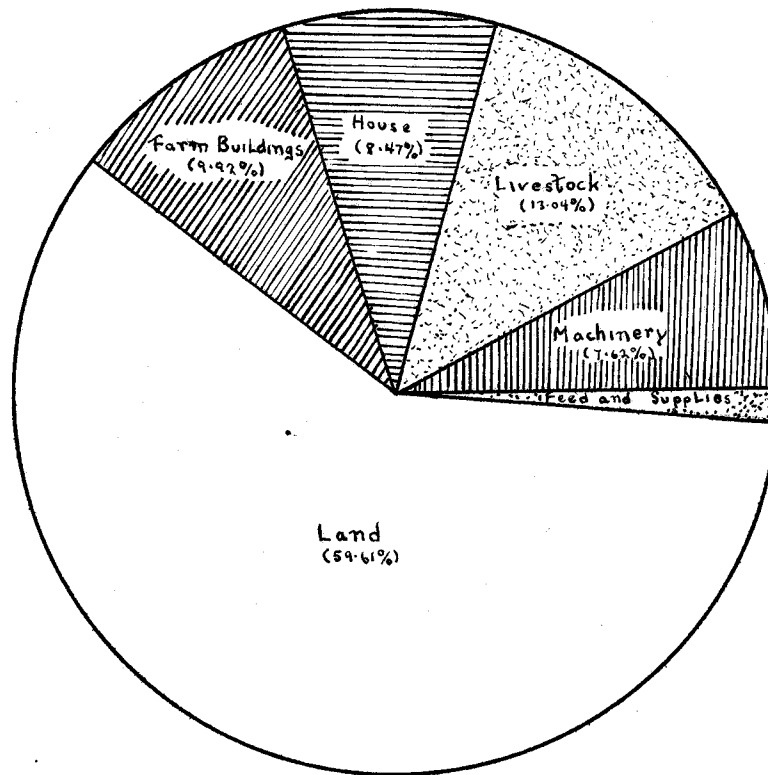
The same principle as above applies in the case of horse labour but not to so great an extent. A horse is a rather large and unwieldy unit of production, and, consequently, the optimum number of horses for each size of farm is not easy to estimate. There is usually an excess or deficiency of horse labour on any given farm. Table No. 1 shows that there was, on the average, about twice as many crop acres per man than there were crop acres per horse.

Fig. 7. AVERAGE ACTUAL CROP ACRES PER HORSE, 1921-30.



(From Table No. 1, Appendix.)

Fig. 8. AVERAGE DISTRIBUTION OF CAPITAL, 1921-30.



(From Table No. 4, Appendix.)

(5) CAPITALIZATION OF THE DAIRY FARMS

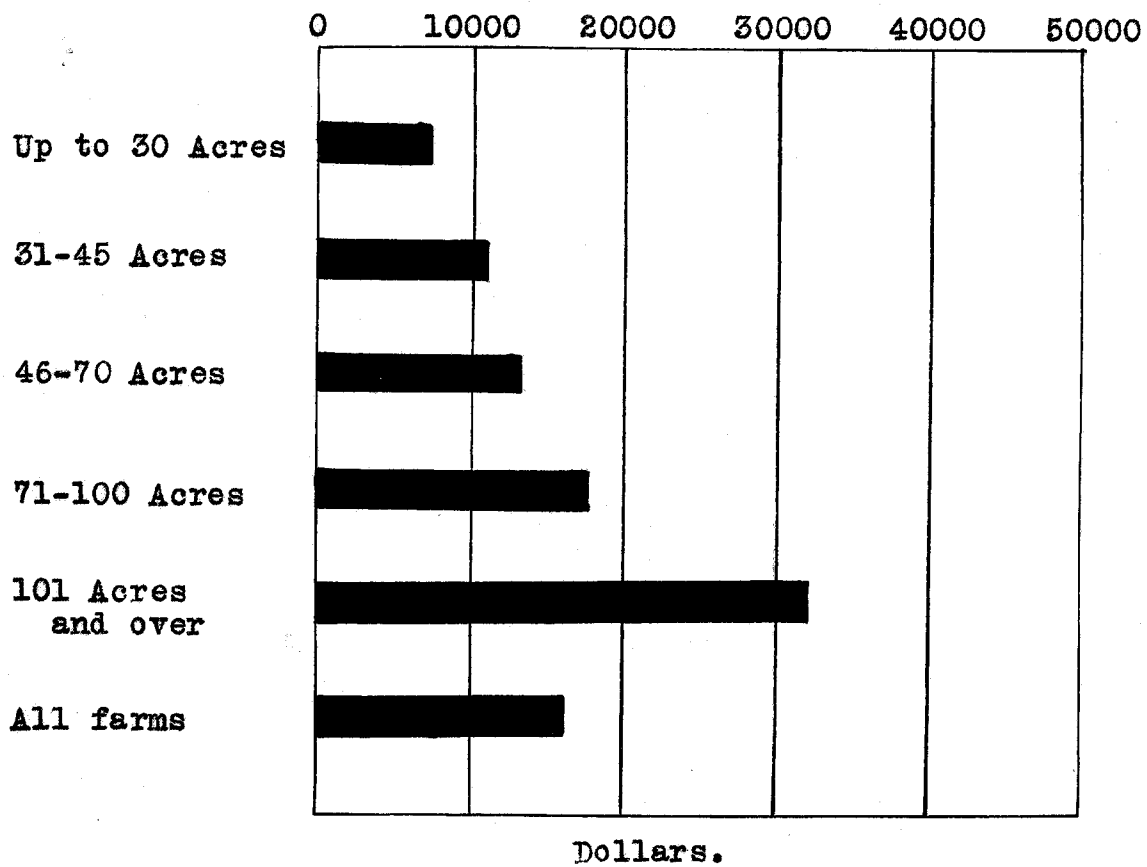
(a) Average make-up of capital for all farms.

In this study of the capitalization of dairy farms, only the operators' capital is considered. It is recognized that the omission of the landlords' share in the total capitalization causes the average figures for the capitalization, determined in this summary, to be less than the figures for the actual capitalization of the farms under consideration. The order of importance of all the items making up the total capitalization is: land, livestock, farm buildings, house, machinery, and, feed and supplies. Land took the lion's share of the operators' capital with 59.61 per cent. Feed and supplies were of negligible importance. The others ranged from 13.04 per cent. for livestock to 7.62 per cent. for machinery.

(b) Total capital.

As would be expected, the larger the farms, the greater the total capitalization. In Table No. 3 we find that the total capital started at \$ 7,569.87 for the smallest group, and increased about \$ 4,000 for each group until the last group was reached, when the capital shot up to \$ 32,016.60. This sudden increase of capital in the last group can readily be explained when we recall that the average size of the farms in the last

Fig. 9. AVERAGE TOTAL CAPITAL, 1921 - 1930.



(From Table NO. 3, Appendix.)

group was much larger than that of the next smallest group, and, since land is such a large factor in the total capitalization, the farms with over 101 tillable acres require much more capital.

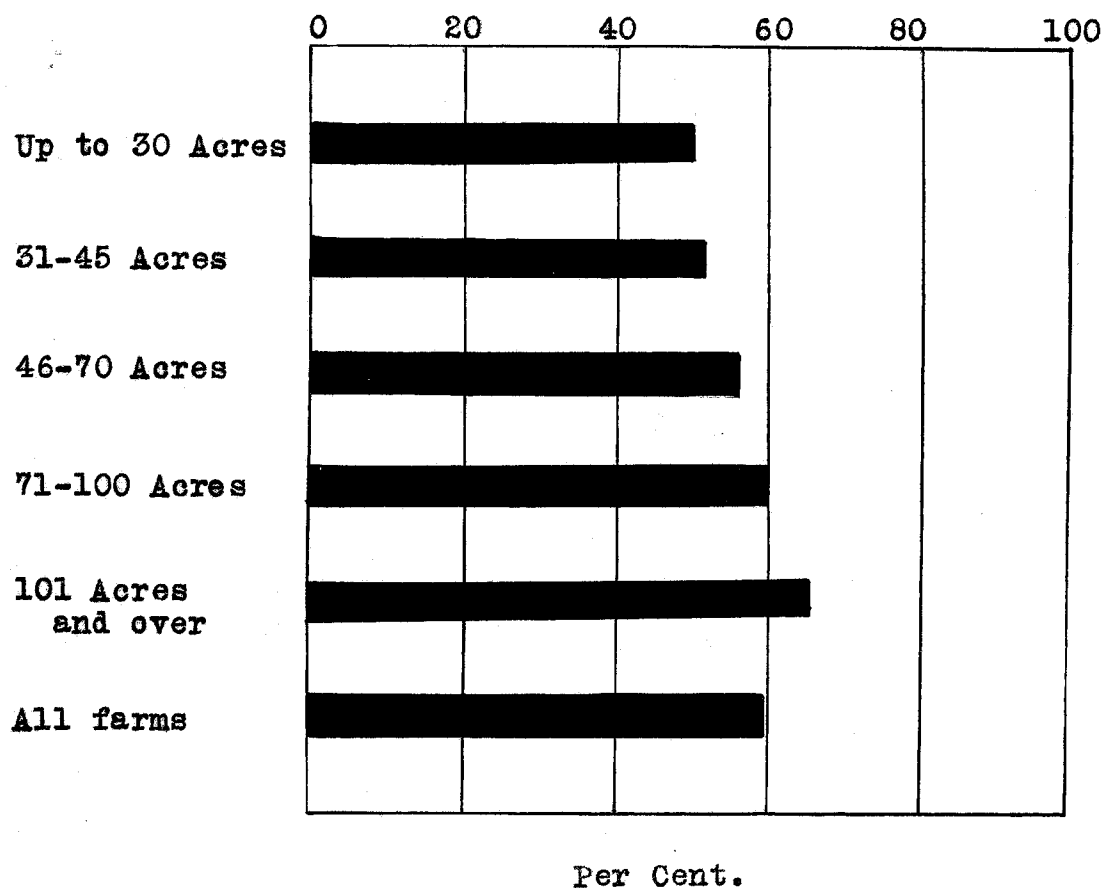
(c) Capital in land.

From the preceding paragraph it may be gathered that, the larger the farm, the more important land becomes as a factor in the capitalization. This is well illustrated in Fig. 10, where it is shown that the percentage of the total capital devoted to land increased from 50.03 per cent. in the case of the smallest group to 65.81 per cent. for the farms over 100 tillable acres. Because of this fact, the larger farms have a considerable advantage over the smaller farms, since land is more directly productive than most of the other items in the capital make-up.

(d) Capital in house.

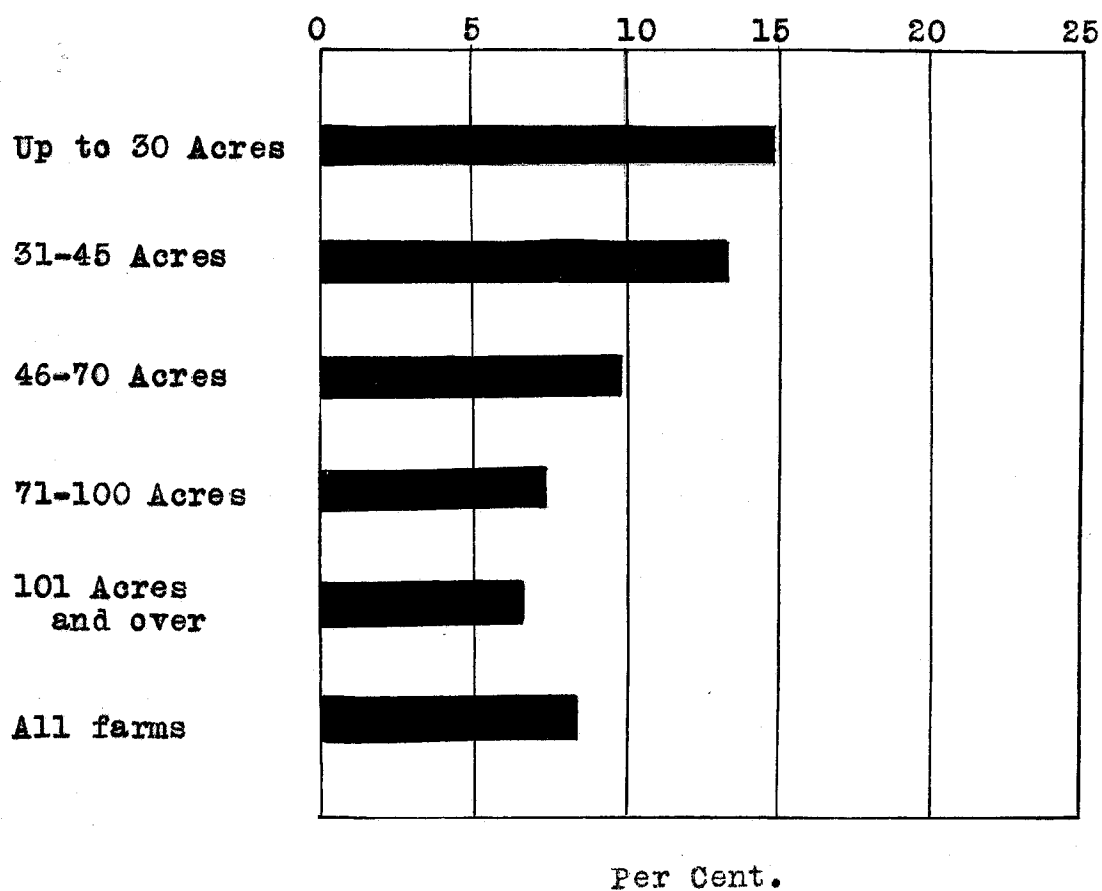
Fig. 11 shows a uniform decrease in the proportion of the capital invested in the farm house from 14.86 per cent. for the smallest group to 5.32 per cent. for the largest group. So far as the actual value of the houses are concerned, there is not much difference between the figures for the acreage groups. The 1 to 30 tillable acres group invested \$ 1,131.03 ~~invested~~ their home, on the average, while the largest group could afford homes worth \$ 1,754.56.

Fig. 10. AVERAGE PERCENTAGE OF CAPITAL IN LAND, 1921-30.



(From Table No. 4, Appendix.)

Fig. 11. AVERAGE PERCENTAGE OF CAPITAL IN HOUSE, 1921-30.



(From Table No. 4, Appendix.)

(e) Capital in farm buildings.

Except for the second group, the trend for the percentage of capital invested in farm buildings was similar to that for the capital invested in the farm house. The owners of farms of from 31 to 45 tillable acres felt that they could afford to place 12.59 per cent. of their capital in the farm buildings, while the others were content to invest from 8.70 per cent. to 11.92 per cent. in this item. The actual value of the farm buildings increased markedly as the farms became larger. The average of all farms for capital invested in farm buildings was \$ 1,627.00.

(f) Capital in machinery.

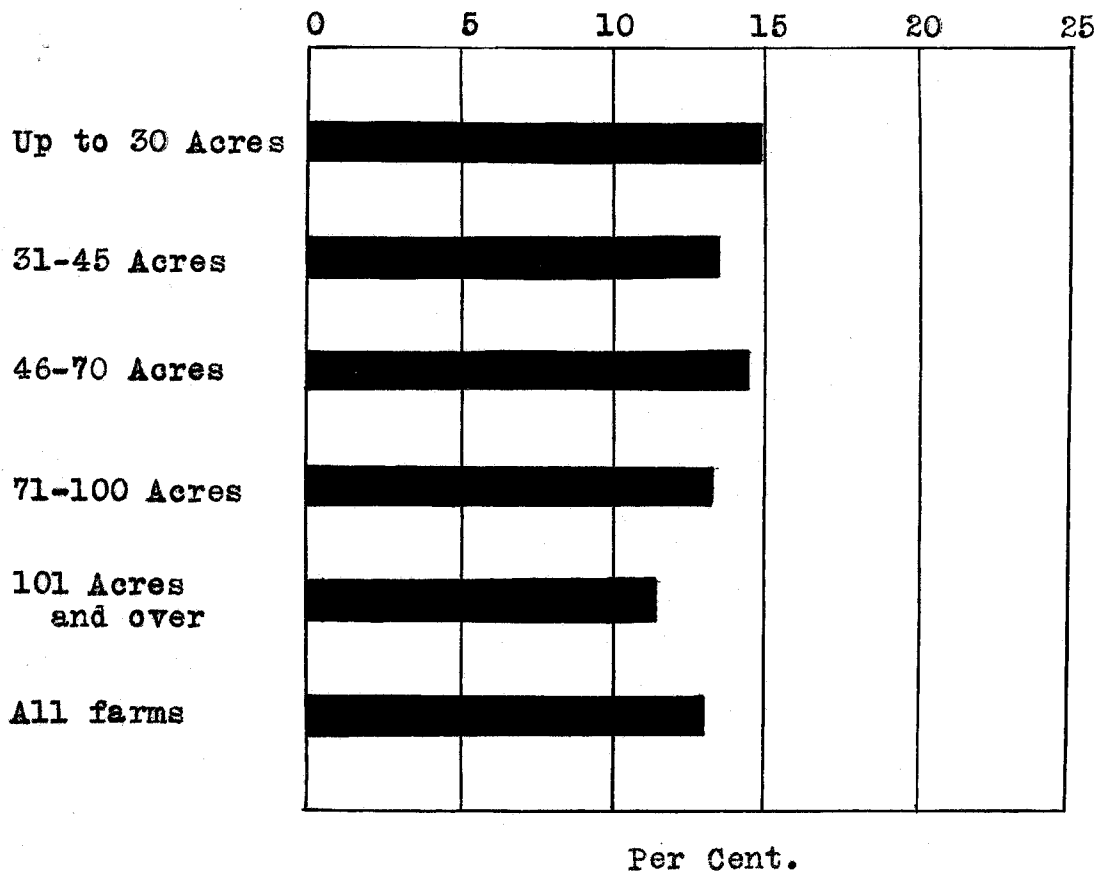
The percentage of capital invested in machinery was greatest in the middle-sized groups, with a peak figure of 8.29 per cent. being reached for the 46 to 70 tillable acres group. As was suggested before, this appears appears to be an off-sized group. It is possible that the operators of farms of this size buy more machinery than they can handle efficiently. As would be expected, the larger the farm, the greater the actual amount of money invested in machinery. This treatise on capitalization is based on figures found in Tables No. 3 and 4. On the whole, therefore, it may be concluded that the small farms have a larger proportion of their capital apportioned to house, farm buildings, and machinery, than the larger farms. Of course this means that the smaller farms have a greater over-

Fig. 12. AVERAGE PERCENTAGE OF CAPITAL IN FARM
BUILDINGS, 1921-30.



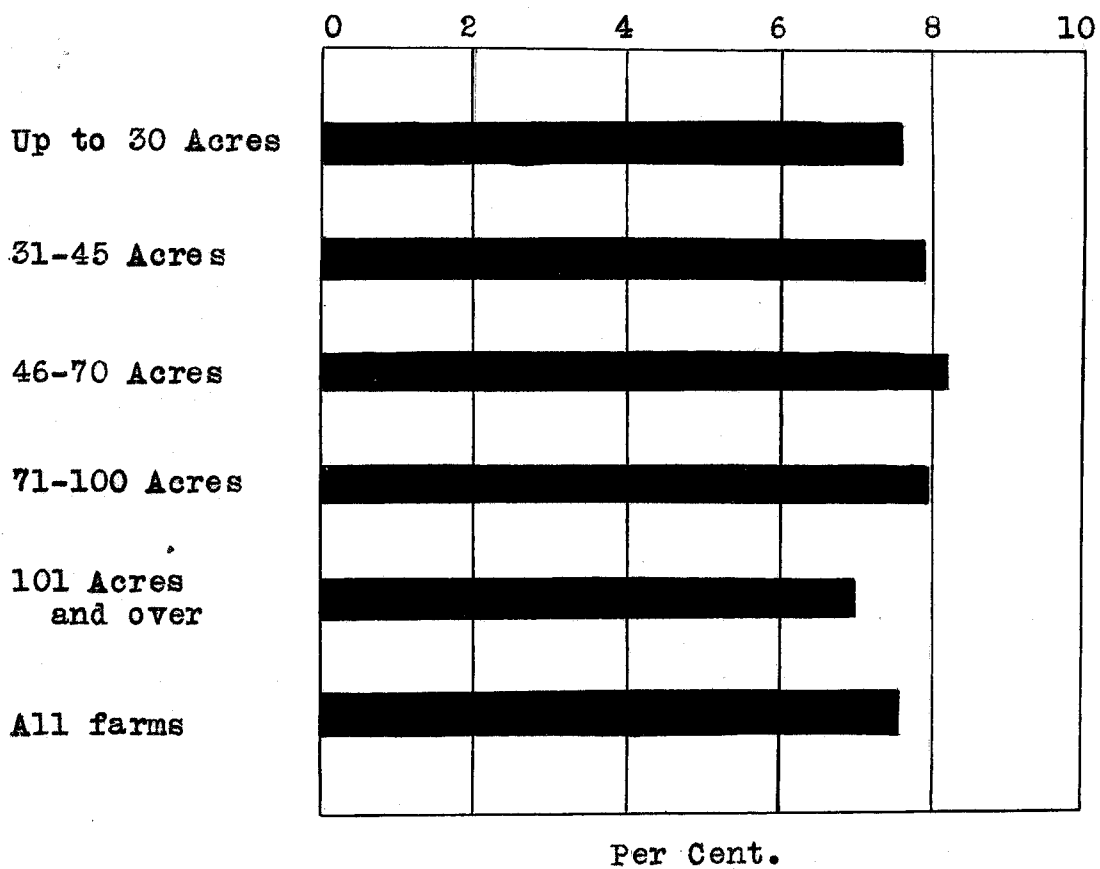
(From Table No. 4, Appendix.)

Fig. 13. AVERAGE PERCENTAGE OF CAPITAL IN LIVESTOCK
1921-1930.



(From Table No. 4, Appendix.)

Fig. 14. AVERAGE PERCENTAGE OF CAPITAL IN MACHINERY
1921 - 1930.



(From Table No. 4, Appendix.)

head expense, proportionately, than the larger farms. Since these items are only indirectly productive, the smaller farms are at a distinct disadvantage in this respect.

(g) Capital in livestock.

On the other hand, the small and middle-sized farms have a larger proportion of their capital invested in livestock than the farms of over 101 tillable acres. This tends to compensate the small-farm owners for their high overhead and relatively low proportion of land to total capital. Actually the largest group invested about \$ 2,500 more in livestock than the 1 to 30 tillable acre group.

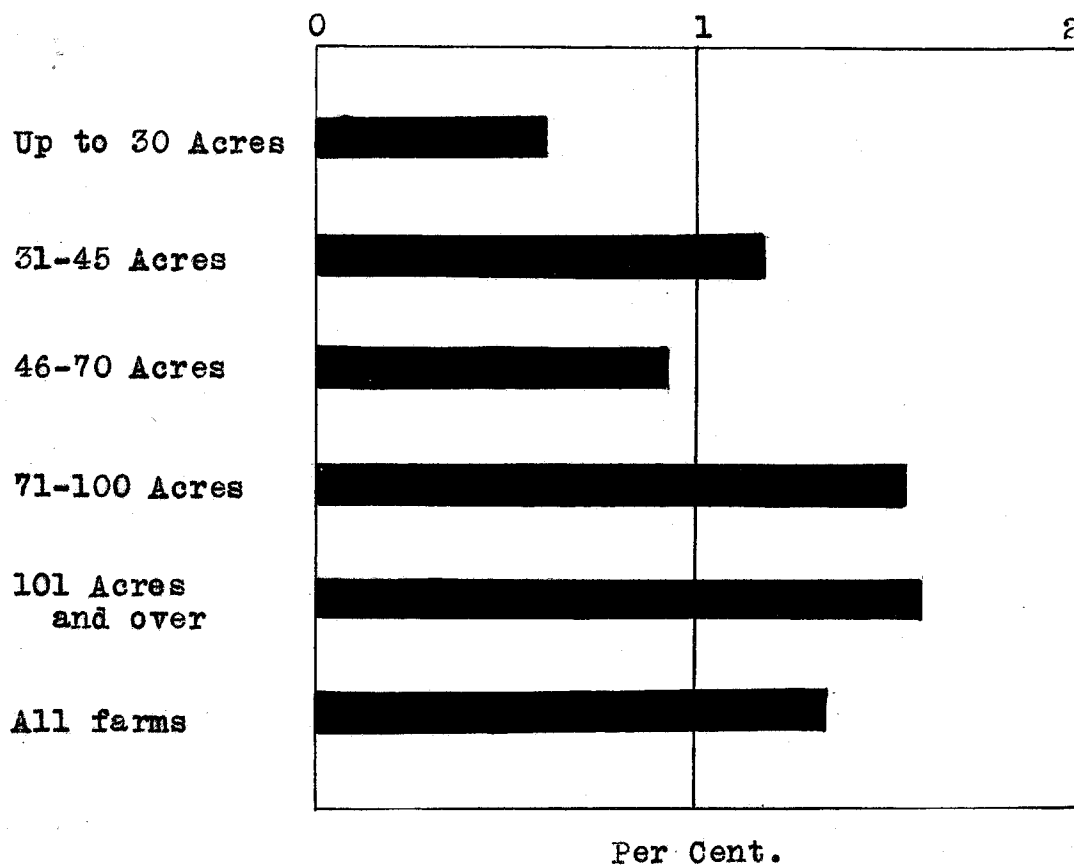
(h) Feed and supplies.

Feed and supplies is a widely fluctuating item. In the fall it attains considerable importance due to the newly-harvested crops being on hand. In the early summer, at the time of the collection of data for the Survey, however, feed and supplies are at a minimum. For all farms this item only made up 1.34 per cent of the total capital, which represented \$219.82 in actual money.

(i) Total capital per tillable acre.

This is a very significant item since it shows the disadvantage under which the small-farm owners labour due to their high overhead. The total capital per tillable acre took a sharp

Fig. 15. AVERAGE PERCENTAGE OF CAPITAL IN FEED
AND SUPPLIES, 1921-30.



(From Table No. 4, Appendix.)

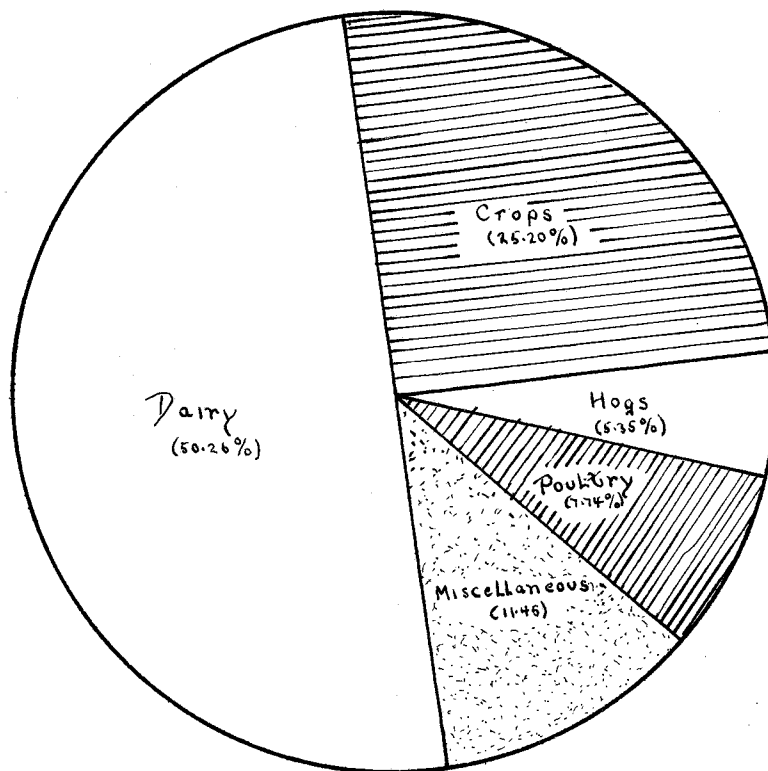
Fig. 16. AVERAGE TOTAL CAPITAL PER TILLABLE ACRE
1921 - 1930.



(From Table No. 3, Appendix.)

drop from \$ 356.08 for Group 1 to \$ 248.55 for Group 3 and then rises slightly until it was at \$ 256.34 for the farms over 101 tillable acres. The trend is well brought out in Fig. 16. The apparent advantage of the middle group is probably due to the fact that it has a smaller percentage of tillable land to actual acreage than the other groups.

Fig. 17. AVERAGE DISTRIBUTION OF RECEIPTS, 1921-30.



(From Table No. 6, Appendix.)

(6)

RECEIPTS.(a) Sources of receipts on all farms.

The average of the total receipts for all farms was \$ 3,875.36. Half of this amount was obtained from the dairy ~~was~~ and one quarter from crops. Miscellaneous sources provided 11.45 per cent. Then came hogs with 5.35 per cent. The returns from sheep were so small as not to warrant inclusion. Only the larger farms carried sheep to any extent, and the average returns from this source rarely exceeded \$ 100.00. Increase in feed and supplies was also too small to include in this analysis.

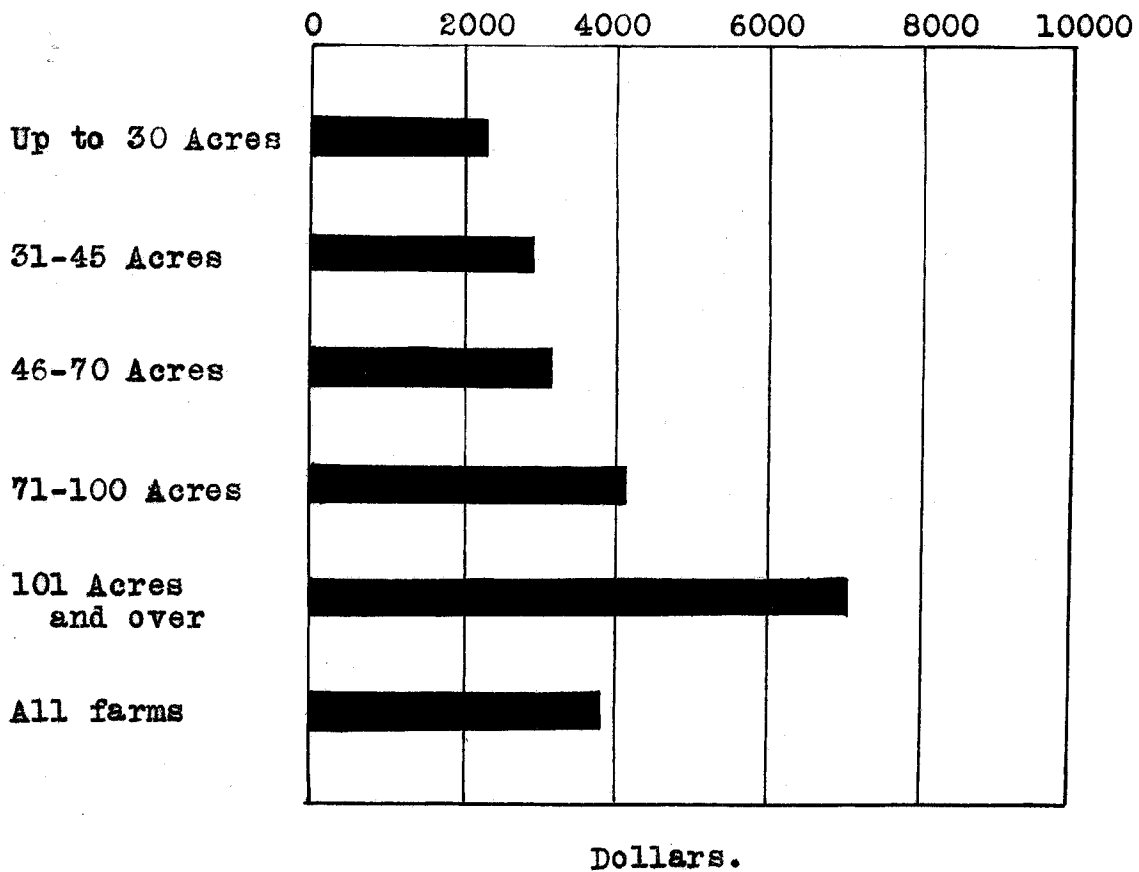
(b) Total receipts.

The total receipts from the smallest group averaged \$ 2,236.38. As the farms became larger, the total receipts increased by about \$ 1,000 for each acreage group, until the last group was reached, when the increase was about \$ 3,000. This difference is again due to the high average number of tillable acres in this group.

(c) Receipts from dairy.

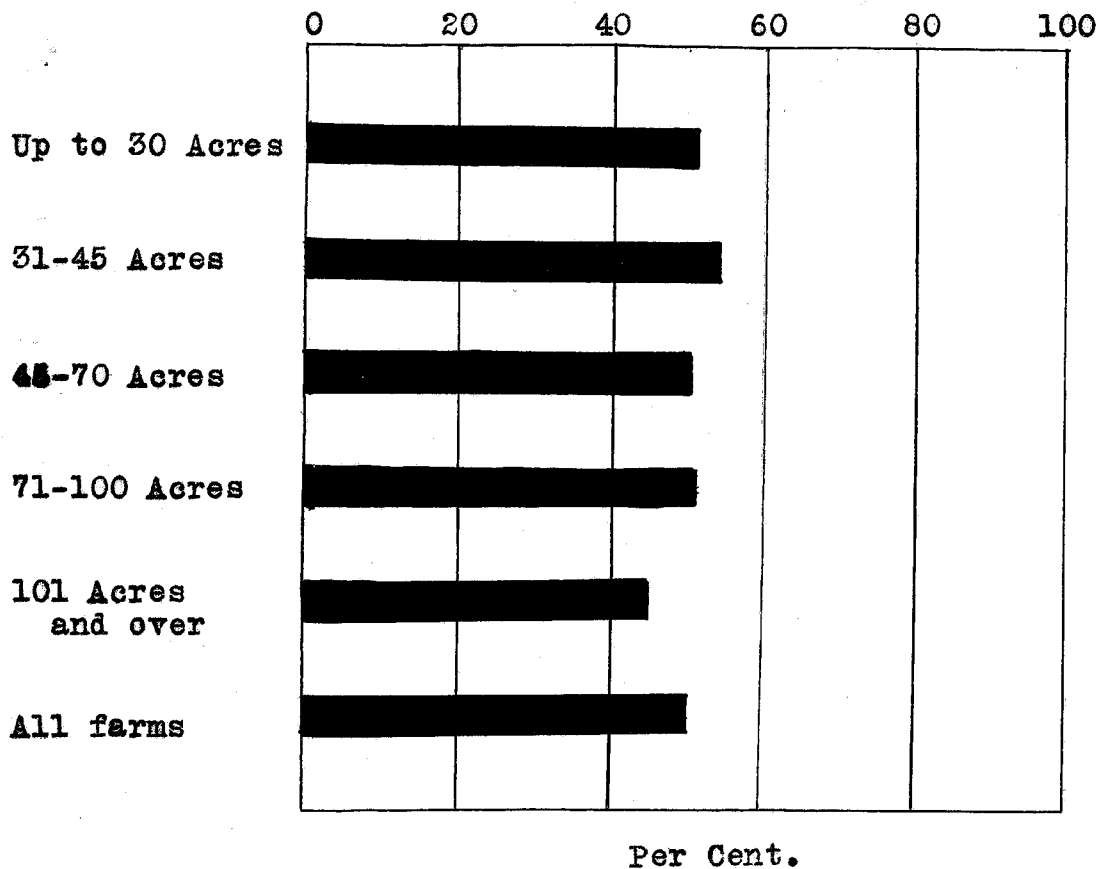
In all the groups, the dairying enterprise contributed the greatest amount of the farm revenue. As is shown in Table No. 6, the farmers with from 31 to 45 tillable acres devoted most of their attention to dairying. As the farms grew larger,

Fig. 18. AVERAGE TOTAL RECEIPTS, 1921 - 30.



(From Table No. 5, Appendix.)

Fig. 19. AVERAGE PERCENTAGE OF TOTAL RECEIPTS
FROM DAIRY, 1921-30.



(From Table No. 6, Appendix.)

there was a tendency for less importance to be attached to the dairy. The farms of 101 tillable acres and over obtained only 44.75 per cent. of their receipts from this source.

(d) Receipts from crops.

Fig. 20 shows how uniformly the percentage of receipts from crops increases as the number of tillable acres increases. This is only natural, since on the larger farms, more attention must be given to the crops and less to livestock, due to the lower labour supply per acre. Group No.1 obtained 10.29 per cent. of its receipts, or \$ 230.05, from crops, as contrasted with 34.50 per cent., or \$ 2,367.47, in the case of farms having more than 100 tillable acres.

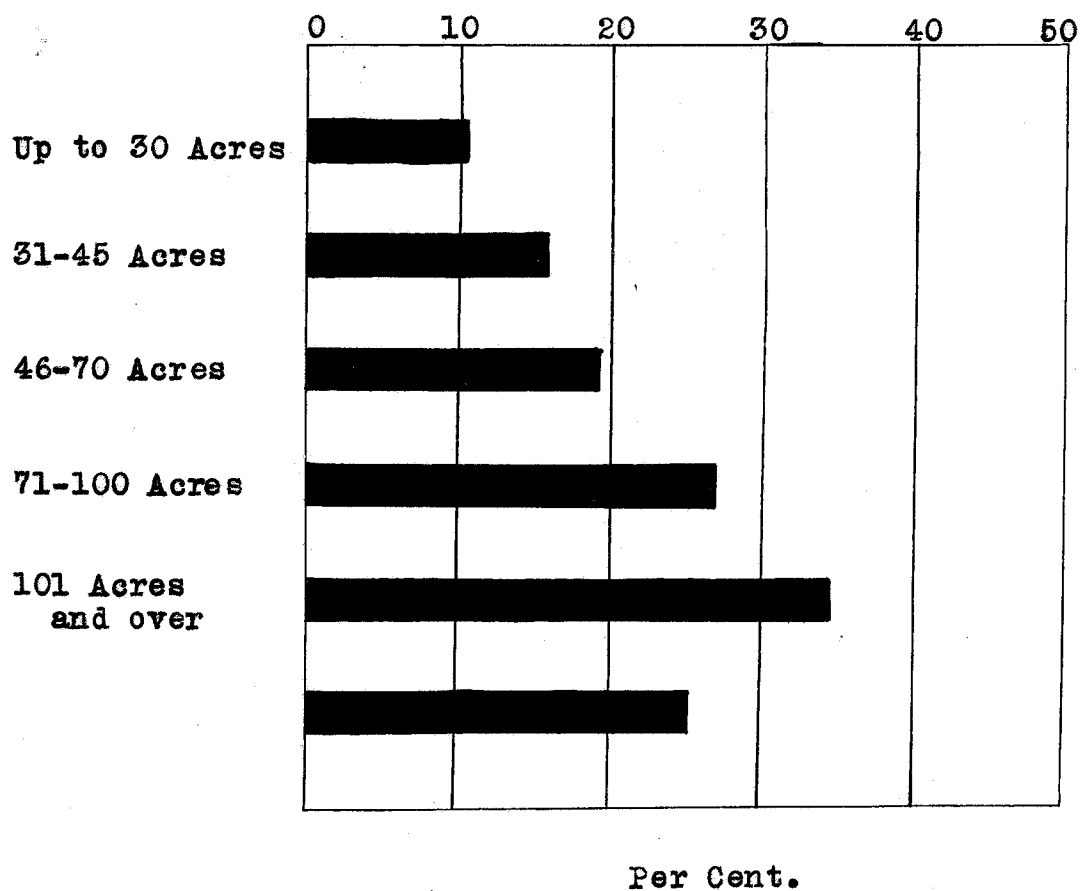
(e) Receipts from hogs.

The medium-sized farms are most partial to hog production. The 46 to 70 acres group obtained 7.42 per cent. of its returns from this source. Fig. 21 indicates the lesser importance swine-raising plays on the other farms groups. The small-sized farms are too intensive, and the large-sized farms are too extensive, in their organization to give much time to this enterprise.

(f) Receipts from poultry.

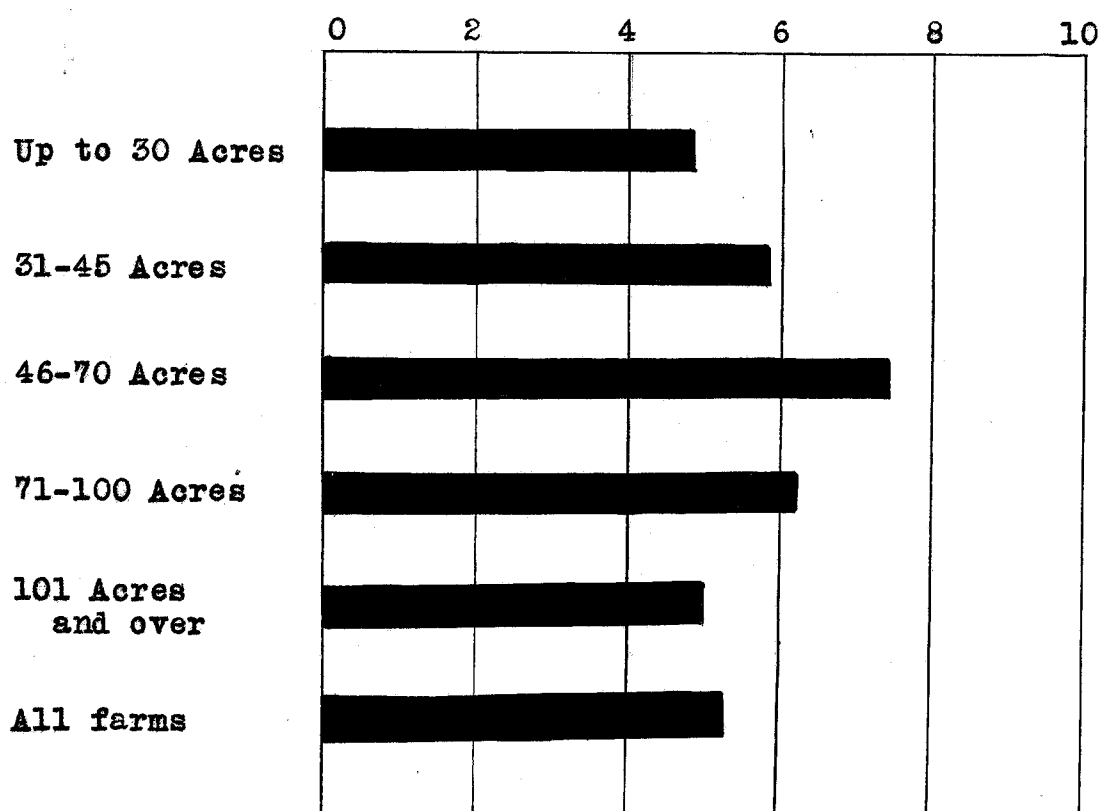
The 1 to 30 tillable acre group appear to have developed poultry production to a greater extent than any of the

Fig. 20. AVERAGE PERCENTAGE OF TOTAL RECEIPTS
FROM CROPS, 1921 - 30.



(From Table No. 6, Appendix.)

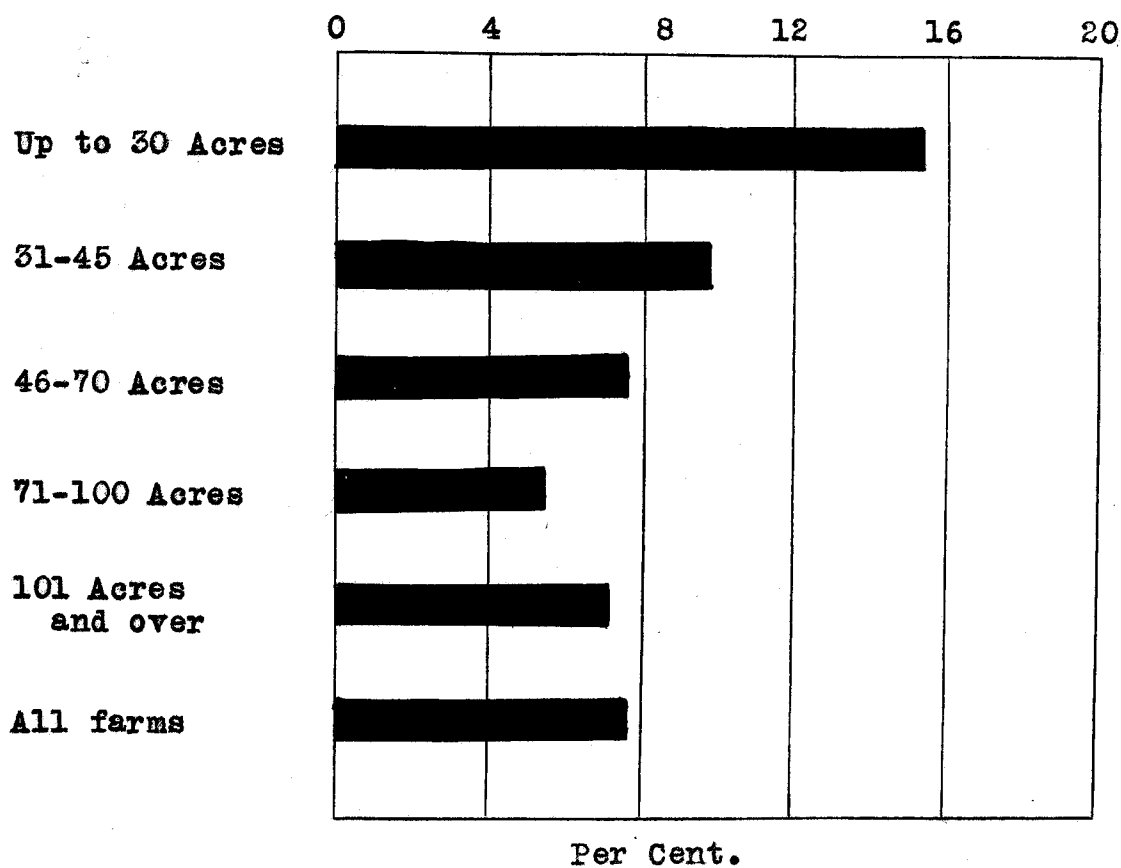
Fig. 21. AVERAGE PERCENTAGE OF TOTAL RECEIPTS FROM
HOGS, 1921 - 30.



Per Cent.

(From Table No. 6, Appendix.)

**Fig. 22. AVERAGE PERCENTAGE OF TOTAL RECEIPTS FROM
POULTRY, 1921 - 1930.**



(From Table No. 6, Appendix.)

others. The smaller-sized farms, with their relatively ample labour supply, are particularly adapted to producing poultry as a sideline. However, although the first group obtained 15.4 per cent. of its receipts from poultry as contrasted with 7.03 per cent. for Group 5, the latter received about \$ 90 more in actual returns from this enterprise than did the smaller farms.

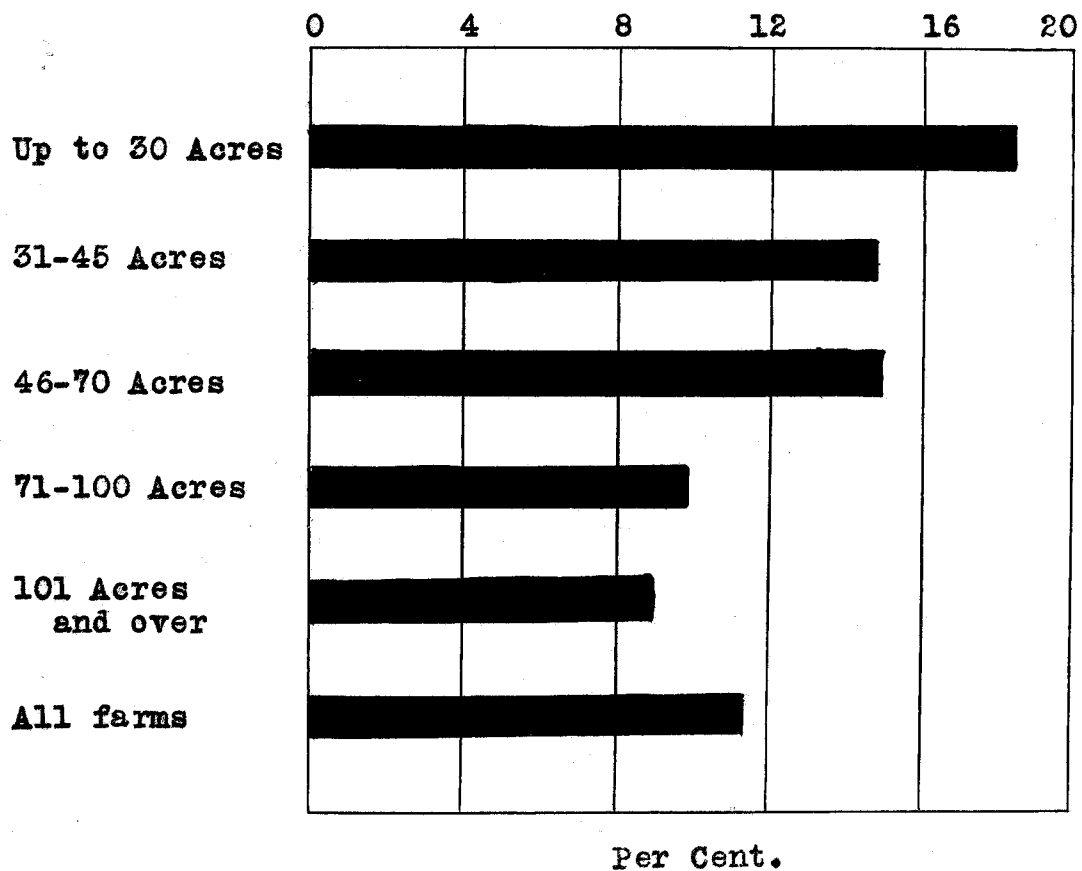
(g) Miscellaneous receipts.

The smaller farms again lead when it comes to the proportion of receipts from miscellaneous sources. There is a gradual decrease in the percentages of the receipts from this source as the farms increase in size, with the exception that the second and third groups are practically the same. The average receipts from miscellaneous sources for all farms was \$ 430.92. These miscellaneous receipts are made up of: income from work done off the farm, wood sold, the rent of machinery, the rent credited to the operator for the use of his house, and many minor items. The rate of the rate of the rent credited to the miscellaneous receipts is 10 per cent. of the house value.

(h) Perquisites.

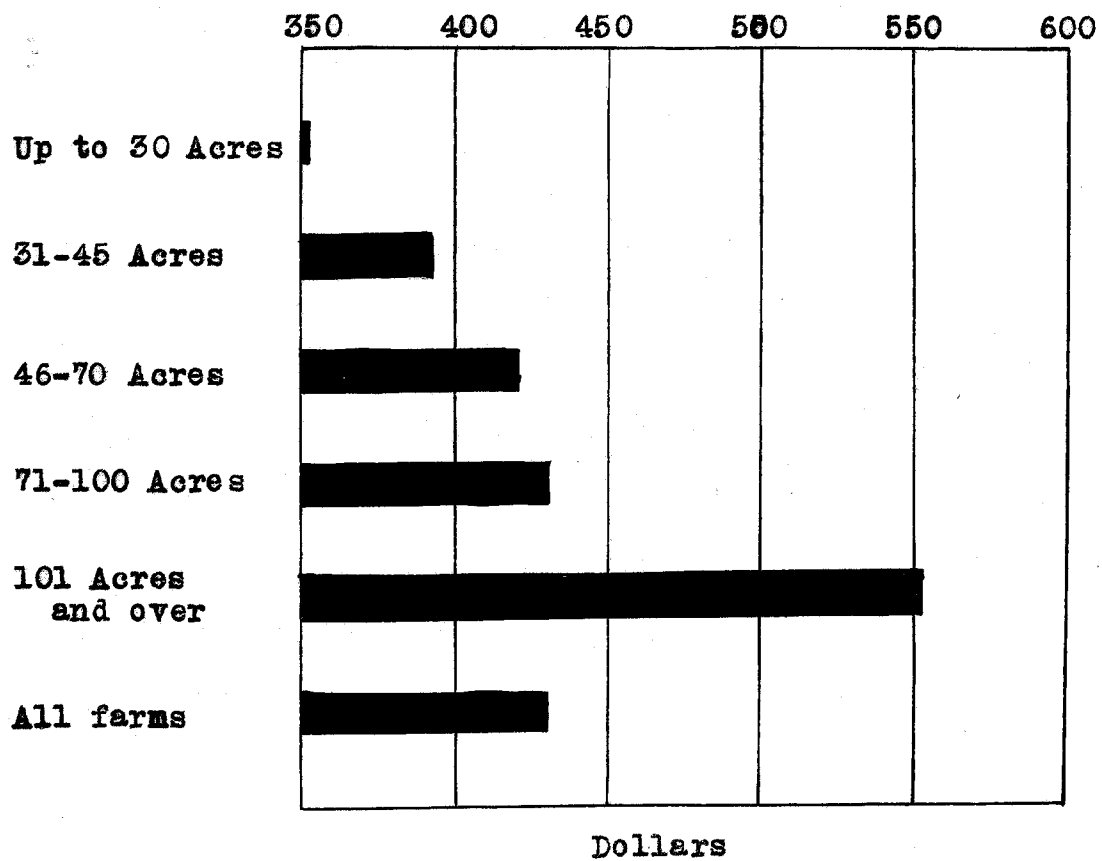
This item, which includes the milk, eggs, fruit, vegetables, etc., "sold" by the farm to the operator's house, was not included in the total receipts, but it is, nevertheless, a theoretical receipt. There was little variation in the value of

Fig. 23. AVERAGE PERCENTAGE OF TOTAL RECEIPTS FROM
MISCELLANEOUS SOURCES, 1921-30.



(From Table No. 6, Appendix.)

Fig. 25. AVERAGE VALUE OF PERQUISITES, 1921-30.



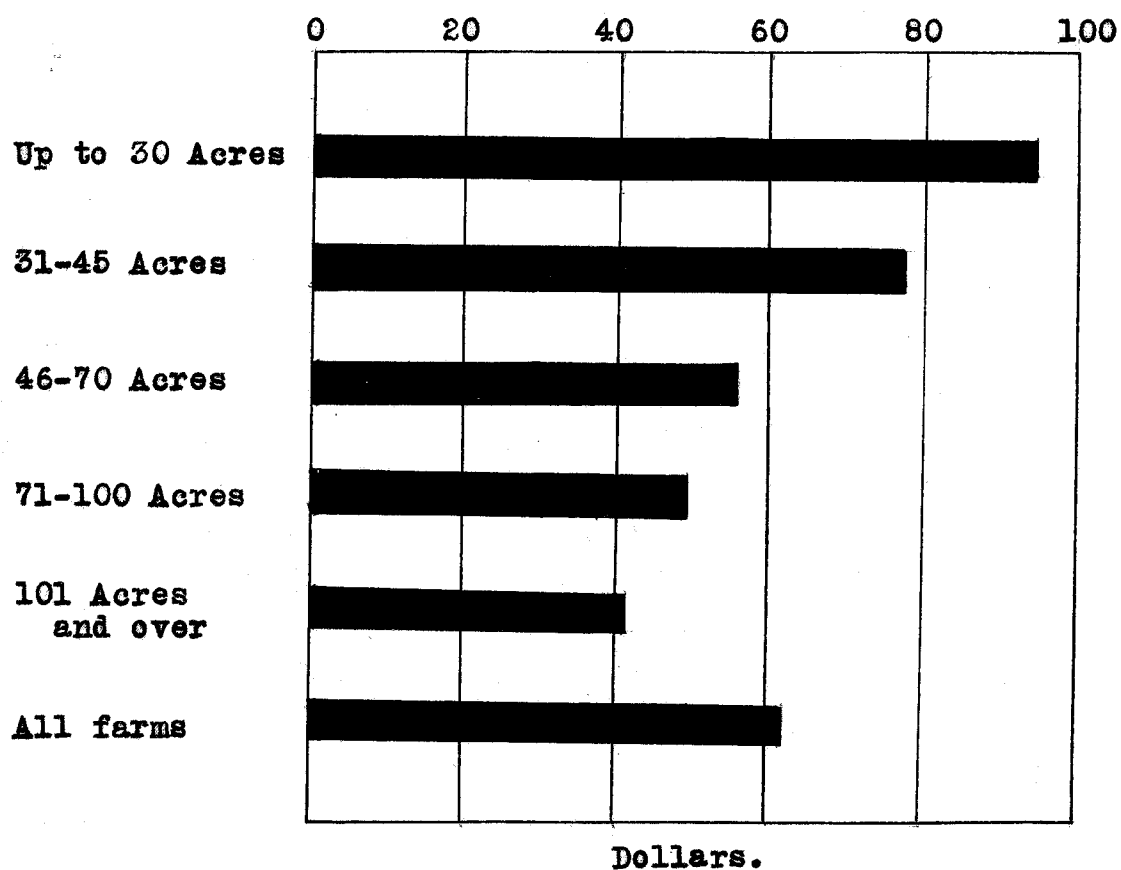
(From Table No. 5, Appendix.)

perquisites between acreage groups, Fig. 25 indicates that there was a gradual increase from \$ 350.59 to \$ 554.40 as the farms increased in size.

(1) Gross receipts per tillable acre.

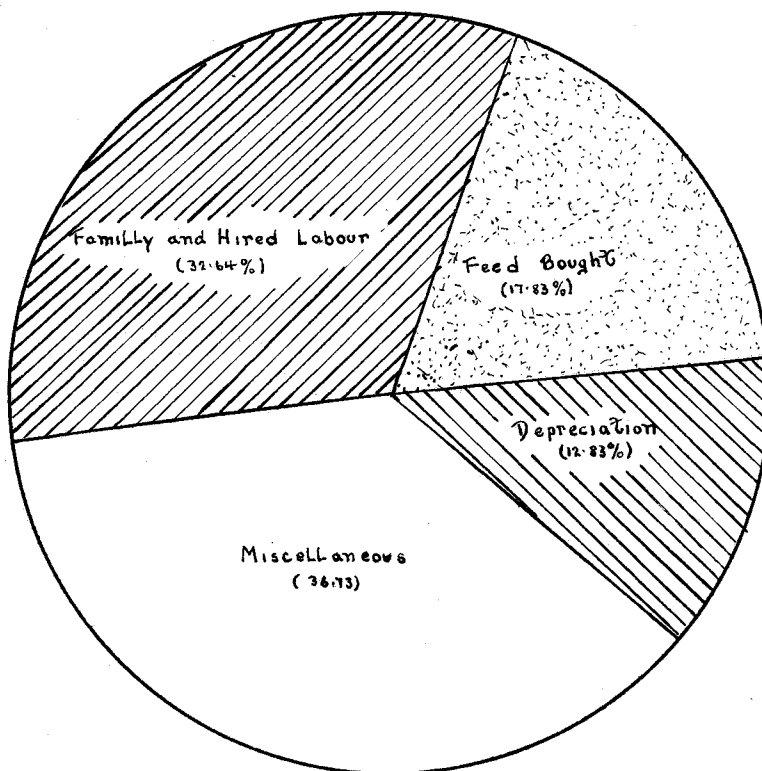
Another very significant item is the gross receipts per tillable acre. Fig. 24 shows the decided decrease in receipts per tillable acre as the size of the farm is increased. There was a range of from \$ 95.04 per acre for the first group to \$ 41.68 per acre for the largest-sized farms. It was because of the farmers' higher receipts per tillable acre that the small-farm owner to compete successfully with the more highly capitalized owner of the larger farms. It was the reward of the intensity of production practised on the small farms. The large-farm owner, unless he is an exceptionally good manager, must content himself with following a less exacting type of agriculture. It should be the aim of all dairymen to build up a large-sized business on the acreage they have at their disposal.

Fig. 24. AVERAGE GROSS RECEIPTS PER TILLABLE ACRE
1921 - 1930.



(From Table No. 5, Appendix.)

Fig. 26. Average disposition of all expenses on
all farms. 1921 - 1930.



(From table No. 8, Appendix.)

(7)

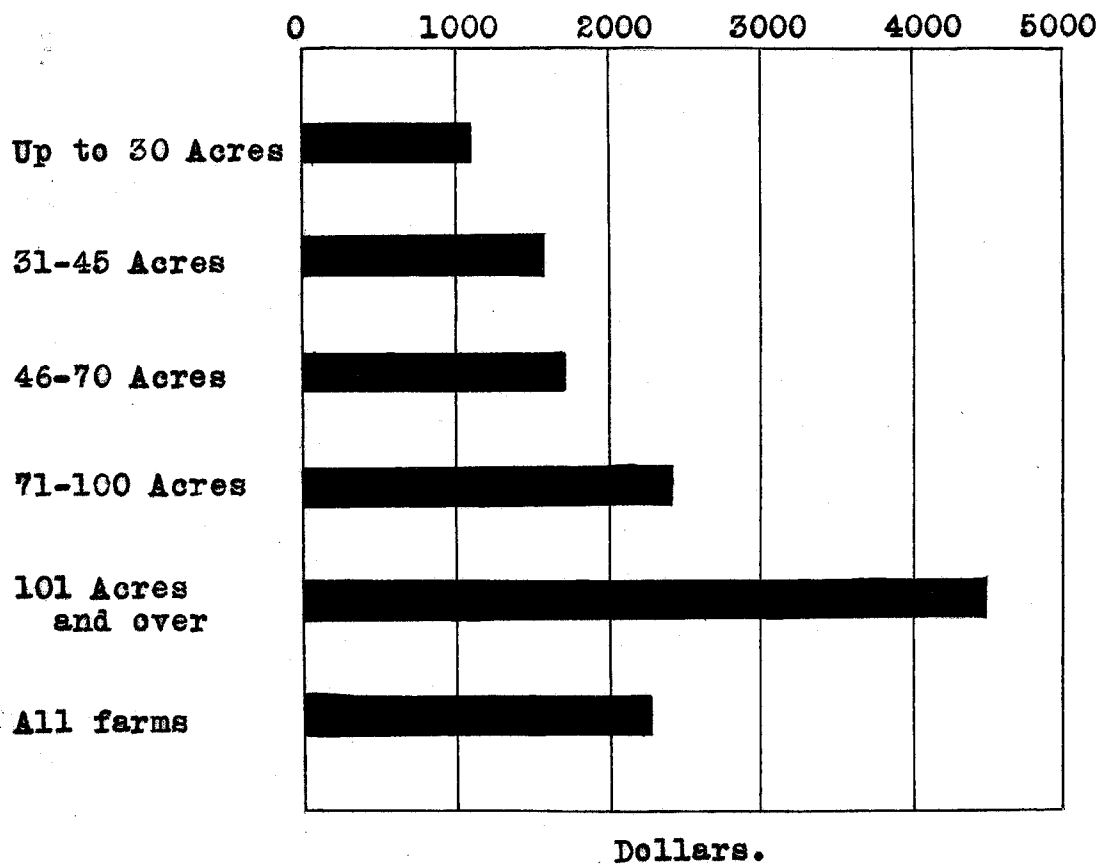
EXPENSES.(a) Analysis of expenses on all farms .

From Table No. 7 we learn that the average of the total expenses on all farms was \$2,273.60. Of this amount, 36.73 per cent. came from miscellaneous sources which we are not interested in at this time. The biggest single item was family and hired labour, which caused 32.64 per cent. of the total expenses on all farms. The next factor of importance was the feed bill, which made up 17.83 per cent. of the expenses. Finally, there was 12.83 per cent. which was set aside to provide for depreciation on buildings and machinery. It may be noted that the average of the expenses for all farms was just a little less than three-fifths of the average of the total receipts.

(b) Total expenses.

Like the total receipts, the total expenses increase as the farms grow larger. However, the increase is by no means as uniform as in the case of receipts. Fig. 27 indicates that the smallest farms had an expense bill of \$1,106.94. The next two groups differed very little in their total expenses. There was a marked increase in expenses, however, in the fourth group when the total expenses reached \$2,452.94, and a still greater increase in the group with over 100 tillable acres.

Fig. 27. AVERAGE TOTAL EXPENSES, 1921 - 30.



(From Table NO. 7, Appendix.)

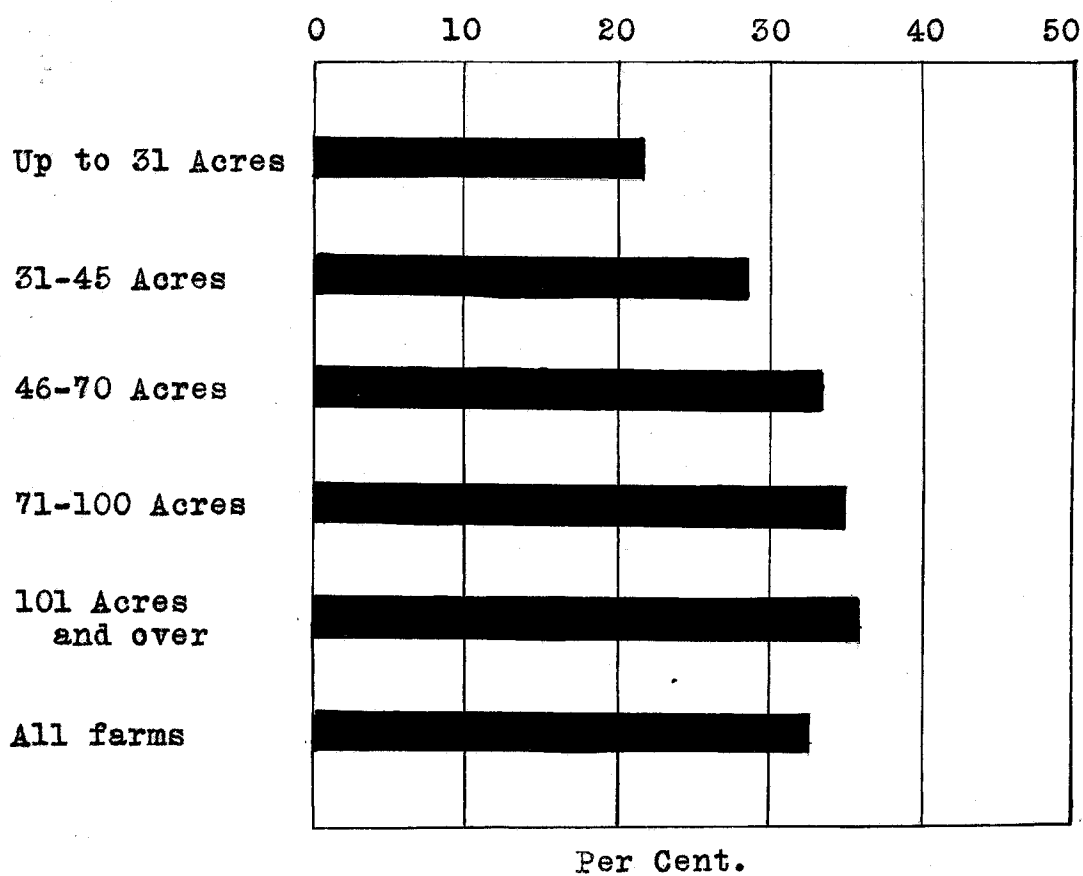
(c) Family and hired labour.

It can be seen at a glance from Fig. 28 that the percentage of the expenses due to family and hired labour increases as the size of the farms increases. The actual figures shown an even more marked increase. The group with from 1 to 30 tillable acres paid only \$235.75 for labour, while the farms of over 100 tillable acres were charged \$1,609.43 for this item. The smaller farms tend to organize their business so that the family can handle most of the work. This keeps their labour bill at a minimum figure. The larger farms, however, are forced to employ more outside labour due to the necessity of handling a large area of land in a short time. The labour expenses of this group are, therefore, higher. It has been observed that the hired labour on the larger farms command a greater wage than the labour on the smaller farms. This may be due to the greater skill required to handle the larger units on the big farms or to the fact that the labour is not so easily supervised on farms of over 100 tillable acres.

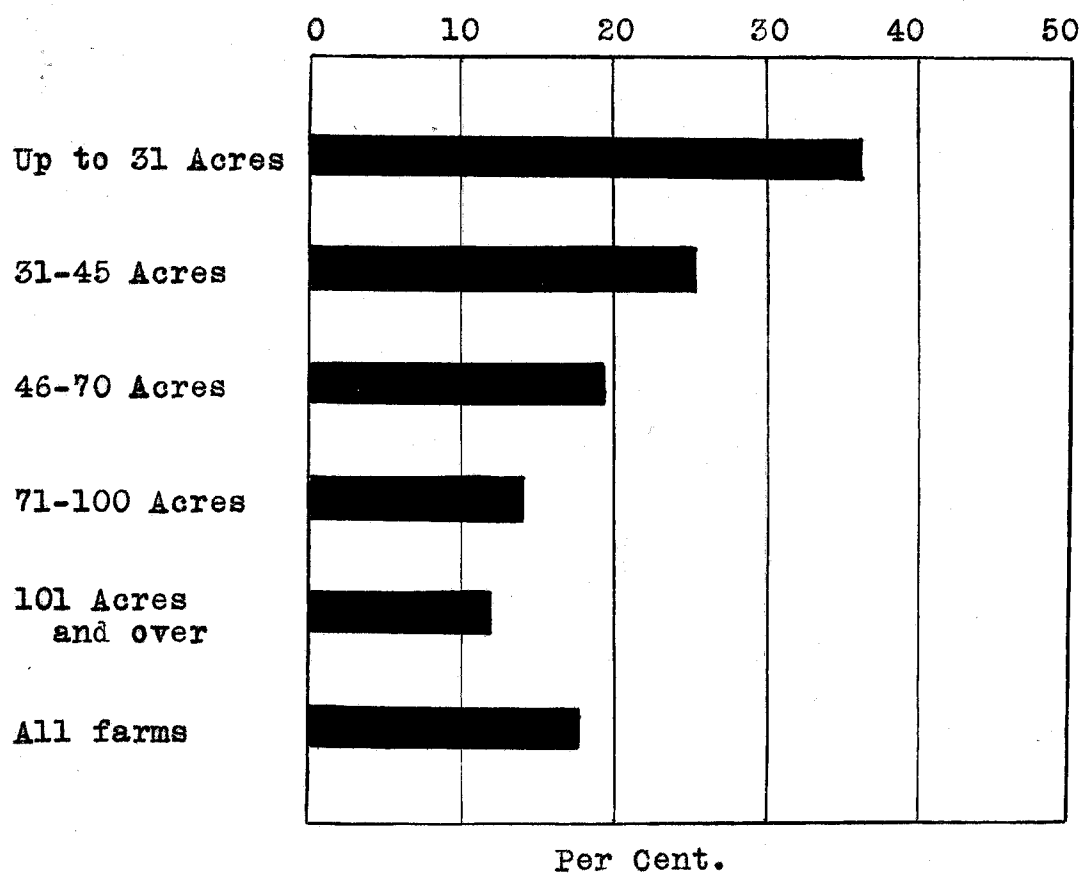
(d) Feed bought.

The actual outlay of money for feed purposes did not vary greatly between acreage groups. The average for all farms was \$405.47, and the expenses from this source increased from \$399.13 for Group 1, to \$559.27 for Group 5. The trend, however, was by no means uniform. When we consider the percentage relations of feed bought to total expenses on the different

FIG. 28. AVERAGE PERCENTAGES OF EXPENSES FROM
FAMILY AND HIRED LABOR, 1921-30.



(From Table No. 8, Appendix.)

FIG. 29. AVERAGE PERCENTAGES FROM FEED BOUGHT**1921 - 30.**

(From Table No. 8, Appendix.)

farms, we find that there was a very decided increase in the proportion of the expenses caused by this factor as the farms decreased in size. It ranged from 36.05 per cent. to 12.37 per cent. as is illustrated in Fig. 29. This was undoubtedly due to the fact that the smaller farms have the highest livestock population per acre, and the smallest amount of tillable land for growing their own feed.

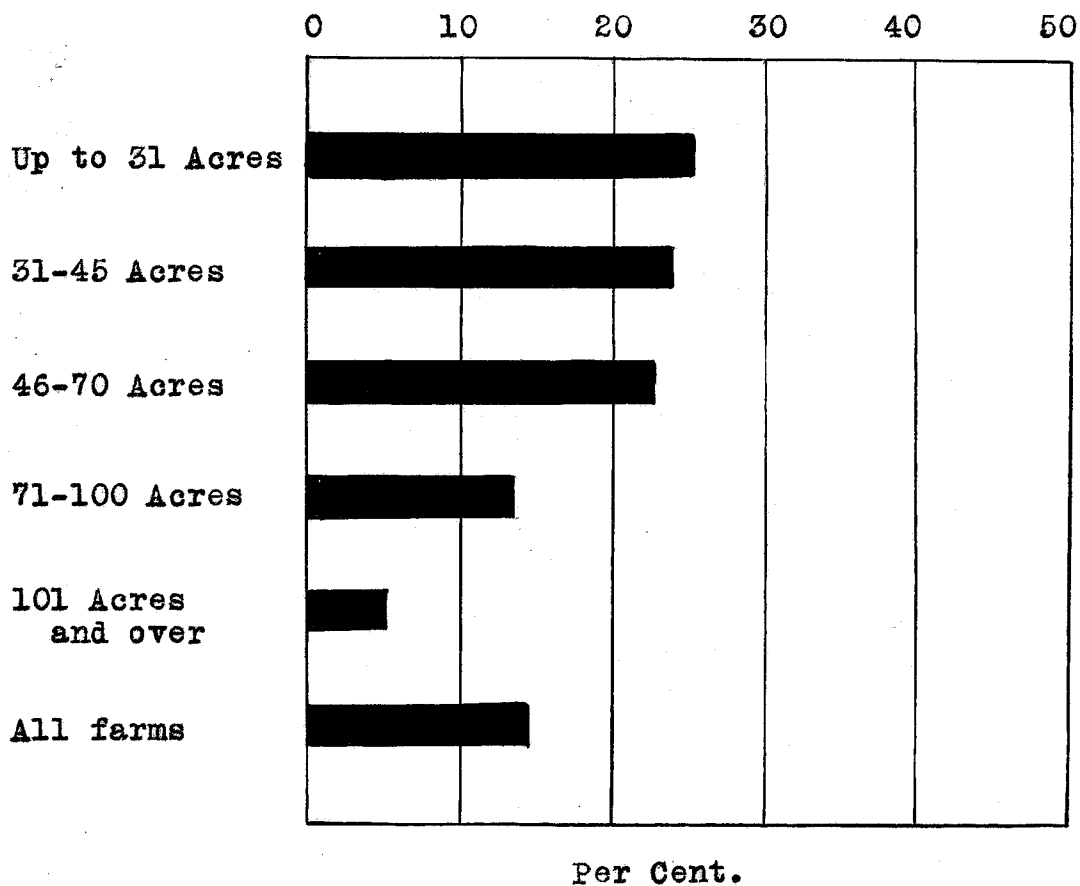
(e) Depreciation on buildings and machinery.

Because of the higher capitalization of the larger farms it is reasonable to expect that they would have to pay more in actual dollars for depreciation. Table No. 7 shows a gradual increase from \$166.28 to \$499.22 as the farms became larger. From Fig. 30, however, we learn that as the farms increased in size, the percentage of expenses due to depreciation decreased. It was not until the farms became larger than 70 tillable acres that the proportion of depreciation decreased markedly. This trend is caused by the higher capitalization per acre of the smaller-sized farms.

(f) Miscellaneous expense.

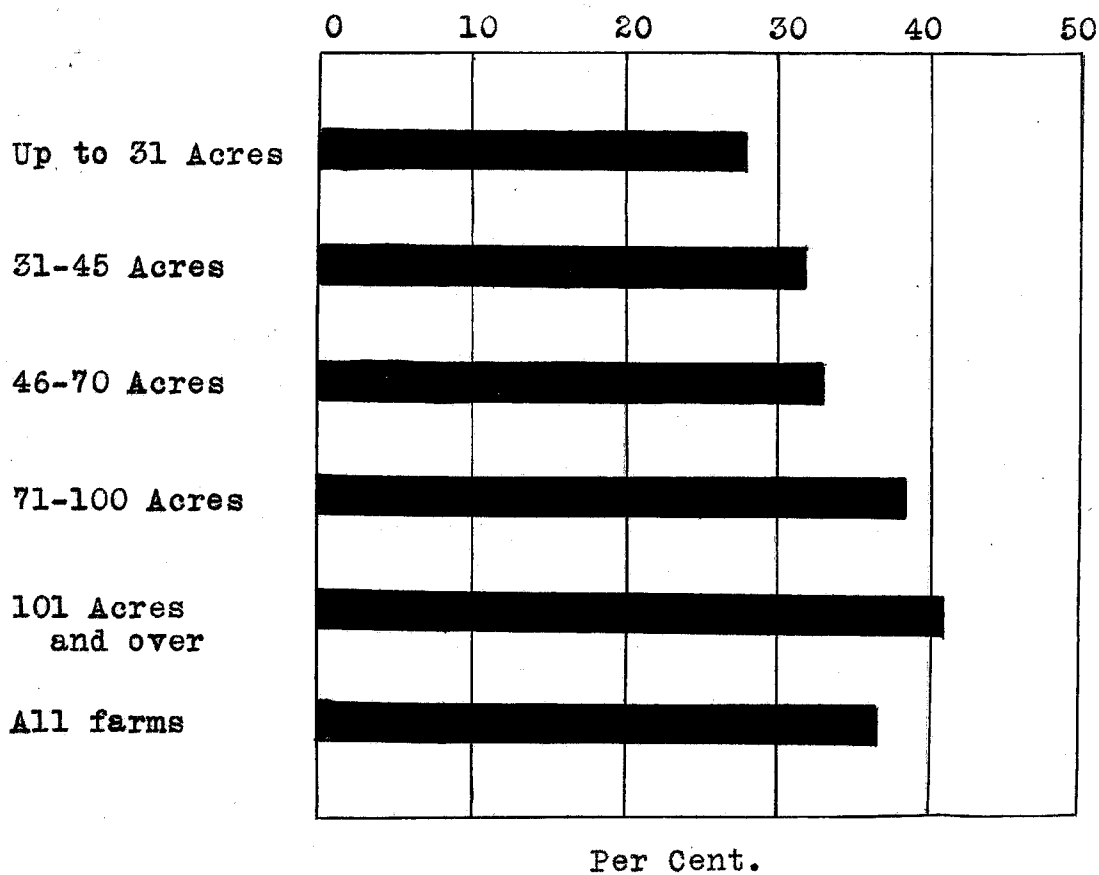
This group contains a large number of items which it did not seem advisable to study separately at this time. It includes: machine work hired, threshing, silo-filling, repairs, seeds, fertilizers, car-operating expense, water-rates, tele-

FIG. 30. AVERAGE PERCENTAGES OF EXPENSES FROM DEPRECIATION
ON BUILDINGS AND MACHINERY, 1921 - 30.



(From Table No. 8, Appendix.)

**FIG. 30. AVERAGE PERCENTAGE OF EXPENSES FROM
MISCELLANEOUS SOURCES, 1921 - 30.**



(From Table No. 8, Appendix.)

phone, insurance, cash rent, electricity, taxes, and many other current expenses. Table No. 7 indicates that the farms with over 100 tillable acres had a particularly large bill due to these miscellaneous expenses, and paid \$1,850.19 for these items. With a decrease in the size of the farms, the cost of the miscellaneous expenses decreased until it reached a figure of \$305.78 for farms under 30 tillable acres. The percentages illustrated in Fig. 30 agree with this trend. Water rates, taxes, insurance, fertilizer, and machine operating expense, probably account for the relatively greater current expenses on the larger farms.

(g) Total expenses per tillable acre.

The trend for total expenses per tillable acre is much similar to that for receipts per tillable acre. With an increase in the size of farms the expenses per acre decrease. The decrease was most marked between the first three groups. The range was from \$50.78 per acre for farms under 30 tillable acres, to \$30.84 for Group 5. The greater relative overhead and feed expense on the small farms tends to counterbalance they have due to their greater returns per acre. It may also be said ~~that~~ the large farms can make more efficient use of machinery and labour and can grow more of their own feed, than the smaller farms. In this way they can lower their expenses per acre.

FIG. 32. TOTAL EXPENSES PER TILLABLE ACRE, 1921 - 30.

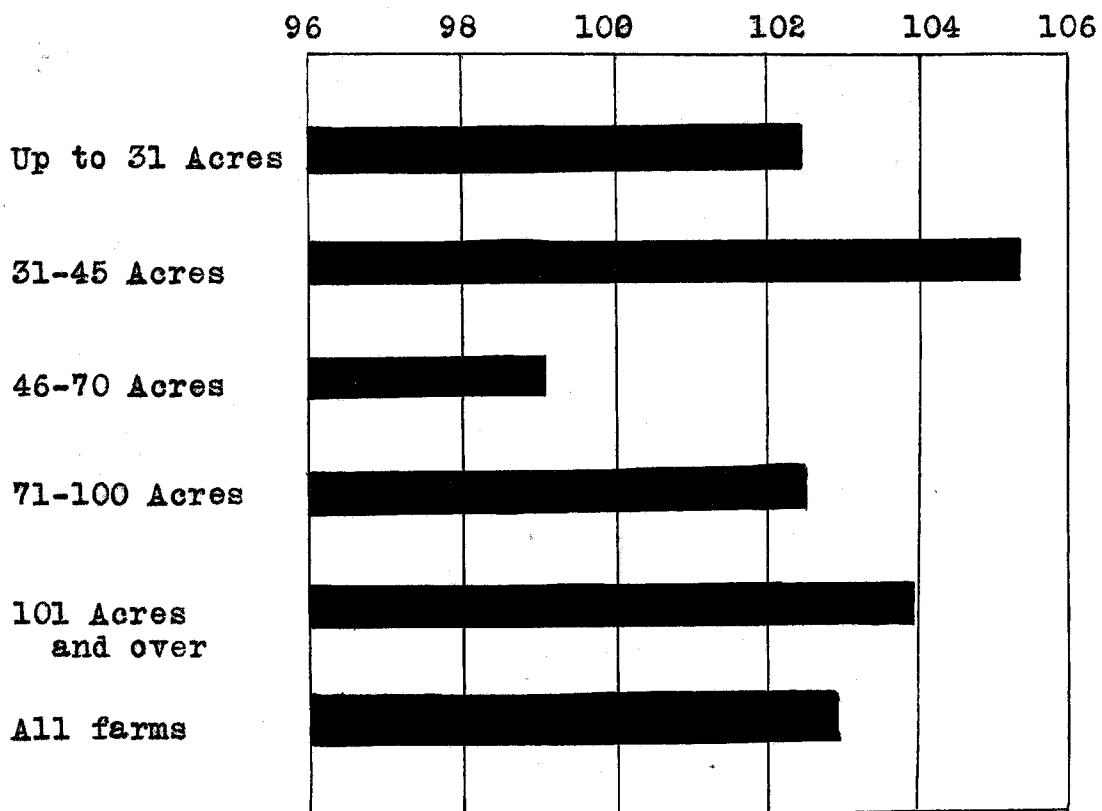


(From Table No. 7, Appendix.)

(8)

EFFICIENCY FACTORS(a) Crop Index.

Fig. 33 indicates that there is no trend in crop indices between acreage groups. Farms having from 31 to 45 tillable acres had the most efficient crop production and obtained a crop index of 105.36. The next largest group, however, had the smallest crop index, 99.13. The average for all farms was 102.96. The advantage to the groups with the highest crop index is obvious. Such farms can reduce their costs by producing more of their own feed. Moreover, farms with a high crop index can support more livestock per tillable acre than can farms with a low crop index. Referring back to Table No. 2, we find that the group with the lowest crop index had also the highest percentage of unproductive land. Although the correlation for all the groups was not very great in this respect, the figures bear out the theory that a high crop index and a high percentage of tillable land go together. The farmer with the larger percentage of crop land tends to farm more intensively than the man with an excess of unproductive land. Another interesting correlation is that between crop index and butterfat production per cow, as illustrated in Fig. 43. It is seen that the farms with from 31 to 45 tillable acres, which had the highest crop index, also secured the greatest number of pounds of butterfat per cow.

FIG. 33. AVERAGE CROP INDEX, 1921 - 30.

(From Table No. 9, Appendix.)

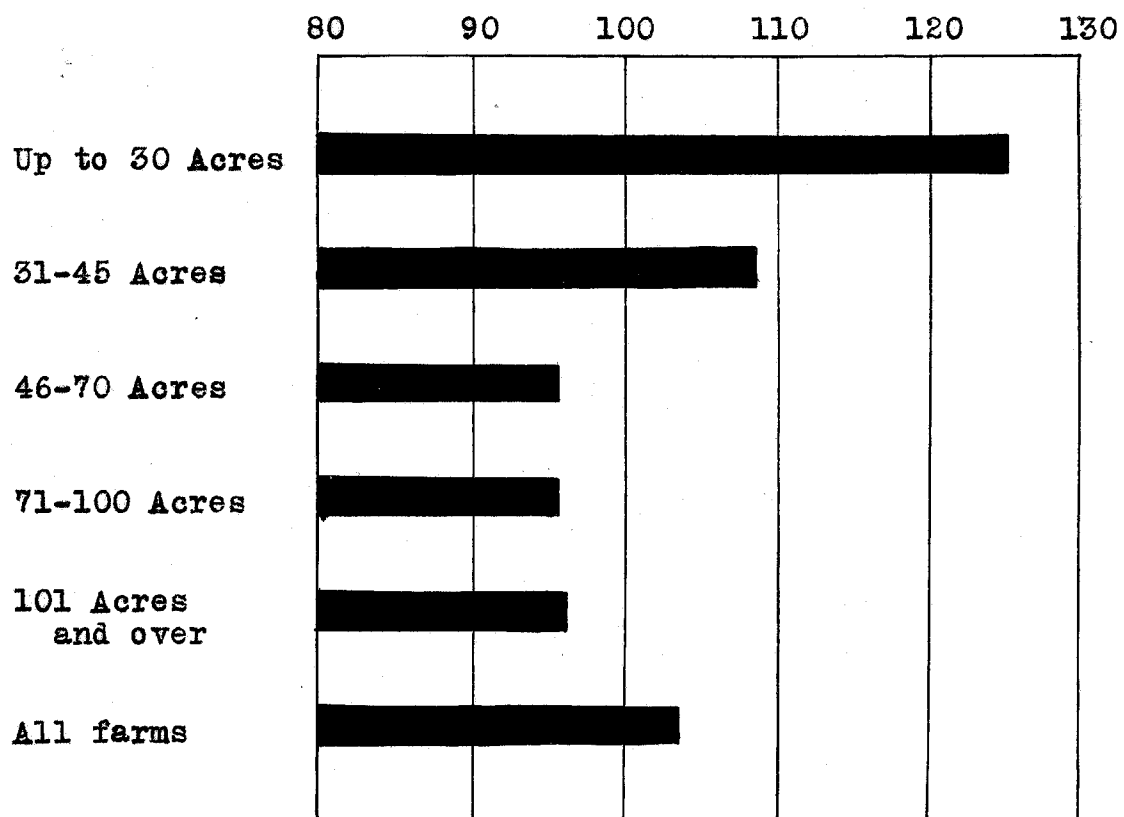
(b) Livestock index.

The common belief that good crops are always associated with good livestock is not substantiated by a study of Fig. 34. This chart shows that the smallest acreage group was by far the most efficient in livestock production, and attained the high index of 124.97. Group 2 was the only other group with an average livestock index over 100. The remaining three groups were practically equal in efficiency of livestock production, and averaged about 95. On the whole, the dairy-farmers are better animal raisers than they are crop producers, as is shown by a comparison of the averages of all farms in Table No. 9.

(c) Total animal units.

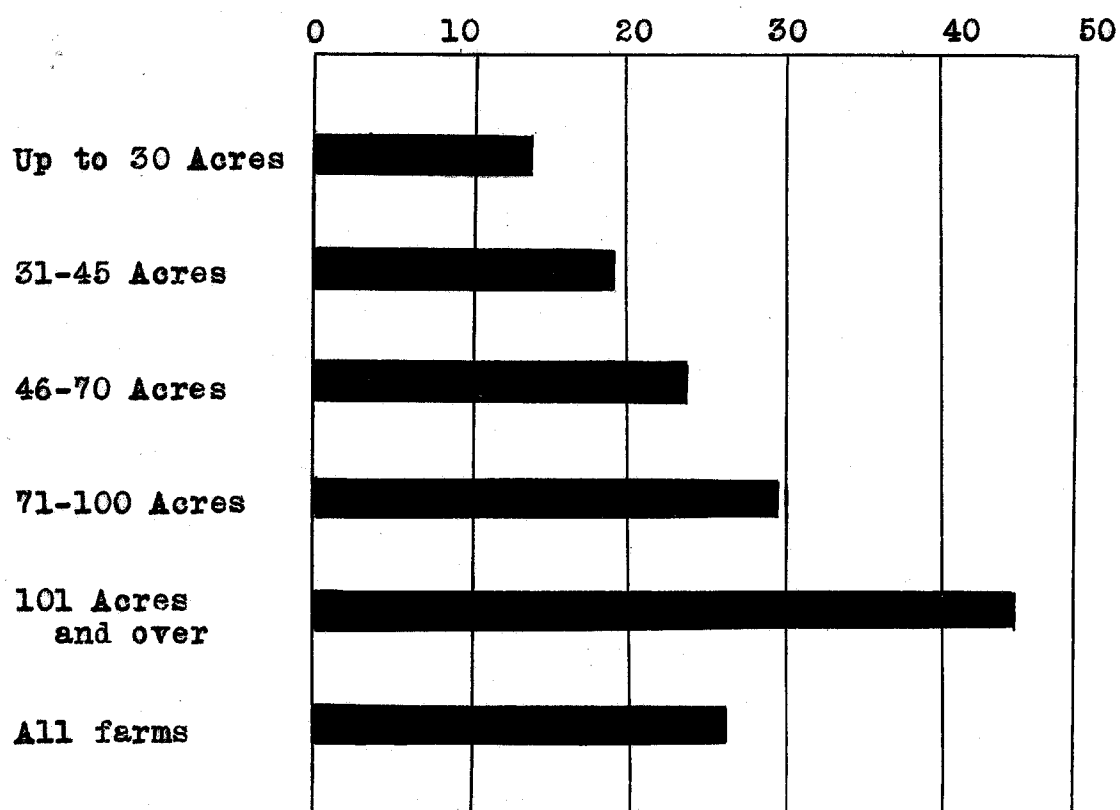
A glance at Fig. 35 will show that the total animal units per farm increased uniformly with an increase in the size of farms. It will be remembered that an animal unit is the equivalent of one mature horse or cow, fed on the farm for one year. All the other classes of livestock are reduced to this basis to make up the total animal units. The first group had an average of 14.6 animal units, while the largest group had an average of 27.10 animal units. From Department of Agriculture Bulletin No. 103, by H.R. Hare, which gave the results of the first five years of the Farm Survey, it was learned that cattle and work horses make most of the animal units. Swine come third, and poultry last, in importance. Sheep were omitted altogether, as their numbers are very low on dairy farms.

FIG. 34. Average Livestock Index, 1921 - 30.



(From Table No. 9, Appendix.)

Fig. 35. AVERAGE TOTAL ANIMAL UNITS, 1921-30.



(From Table No. 9, Appendix.)

Another interesting fact gleaned from this bulletin is that the larger farms carried a greater number, and also a greater percentage, of young stock in proportion to the number of milk-cows than did the smaller farms. Where skim milk was available, the raising of hogs assumed some importance. The medium-sized farms had the largest number of animal units in hogs.

(d) Number of tillable acres per animal unit.

Like the total animal units, the average number of tillable acres per animal unit increased as the size of the farm increased. In other words, the number of animal units per tillable acre is less on the larger farms than it is on the smaller farms. Each animal unit had only 1.49 acres on the farms under 30 tillable acres, while group No. 5 allowed 3.64 acres for each animal unit. Concentration of livestock is possible on the smaller farms due to the relatively ample supply of labour.

(e) Gross receipts per animal unit.

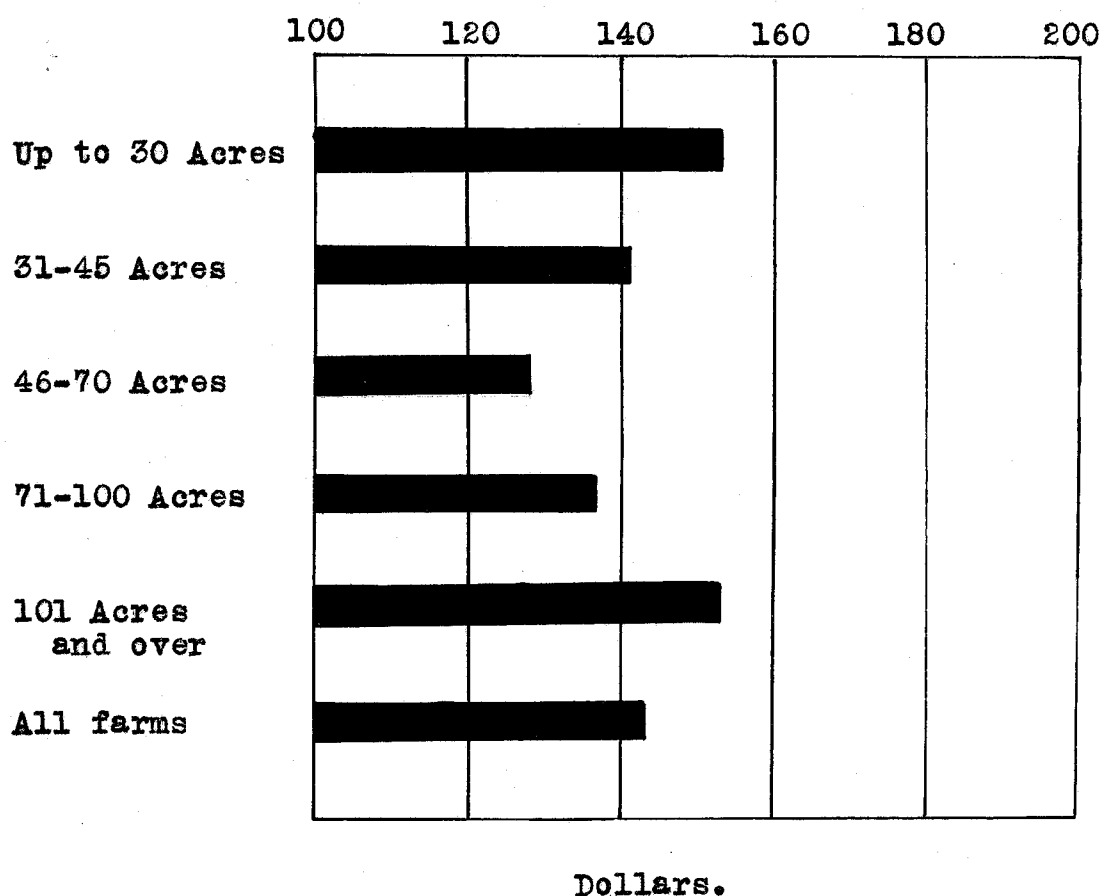
Fig. 41 shows an interesting trend in the returns which livestock yield on the various-sized farms. Group 3, 46 to 70 tillable acres, which we have described before as being off-sized, secured only \$127.97 per animal unit. The groups on either side did a little better, and obtained about \$140 per animal unit. The two extremes in size, however, ran a close race for the highest returns on this basis. Both Groups 1 and 5

Fig. 40. AVERAGE NUMBER OF TILLABLE ACRES
Per ANIMAL UNIT, 1921-30.



(From Table No. 9, Appendix.)

FIG. 41. AVERAGE GROSS RECEIPTS PER ANIMAL UNIT, 1921-30.



(From Table 9, Appendix.)

obtained \$153 per animal unit.

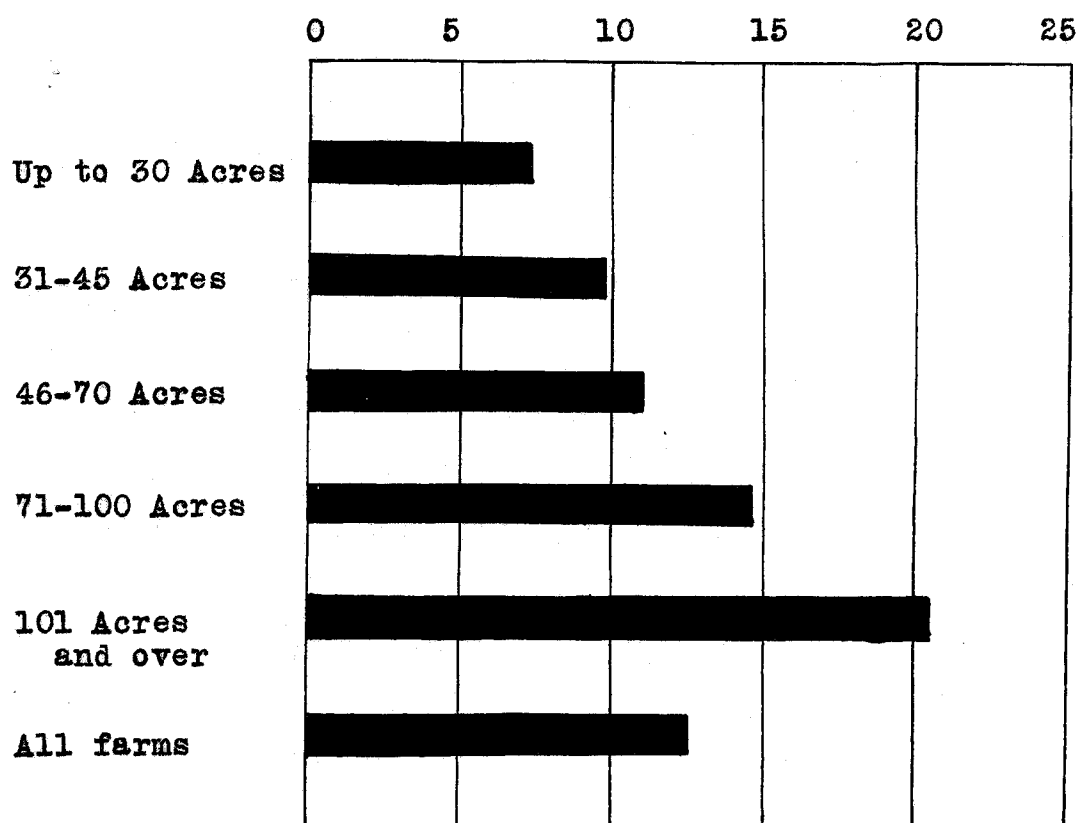
(f) Number of cows.

The reason why the large farms received as high a gross return per animal unit as the smallest farms, when the latter specializes to a greater extent in livestock production, may be found from a study of Fig. 42. In this chart is shown that the average number of cows increased from 7.33 for Group 1 to 20.65 for farms with over 100 tillable acres. The average for all farms was 12.65 cows. This advantage in the number of cows which is possessed by Group 5 allows favorable comparison of its gross receipts per animal unit with those of Group 1. The farms under 30 tillable acres had the greatest percentage of poultry and other livestock in their animal unit make-up. Since these livestock enterprises are not so profitable on the dairy-farms as the dairying enterprise itself, the gross receipts per animal unit for the first group are not so large as might be expected.

(g) Pounds of butterfat per cow.

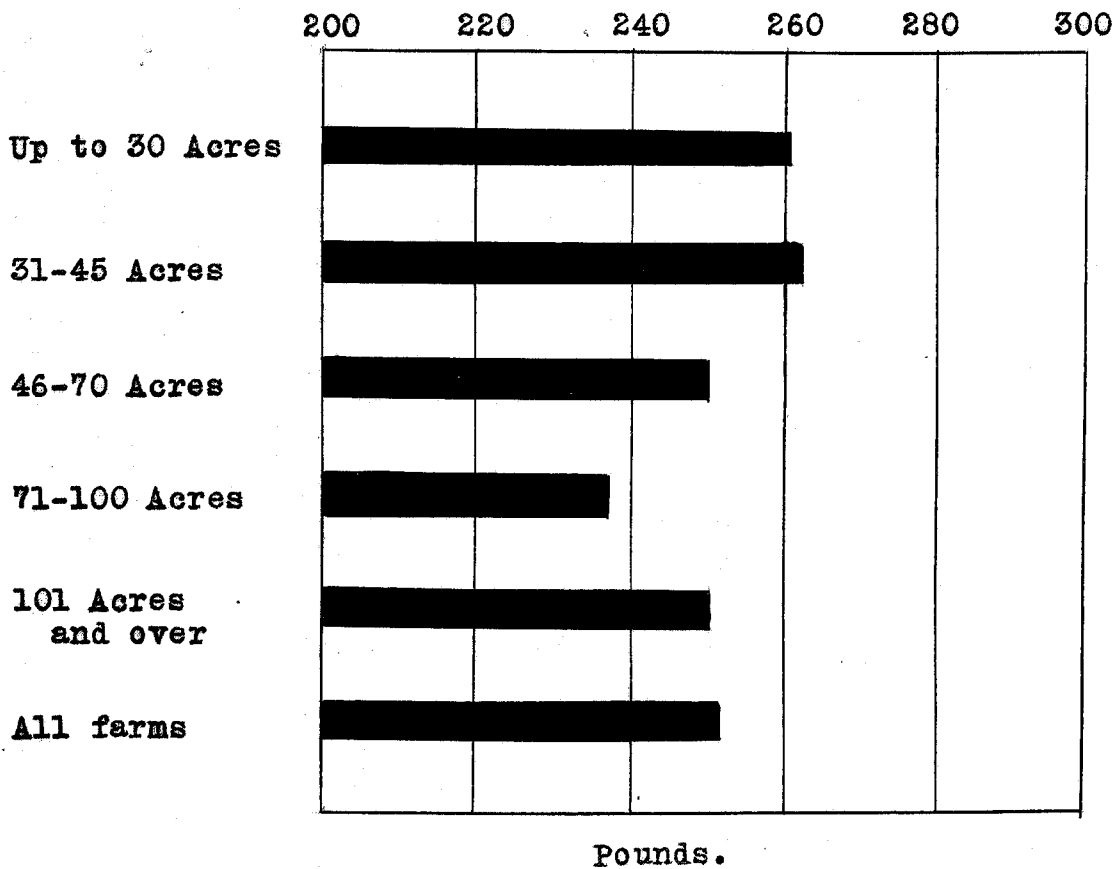
Outside of management, there is probably no other factor which influences the financial returns of the dairy-farmer to such an extent as the butterfat production per cow. There are few periods of depression which the dairy farmer cannot weather if his milk production per cow is sufficiently high. The average production for all farms was 252.15 pounds, and the av-

FIG. 42. AVERAGE NUMBER OF COWS, 1921-30.



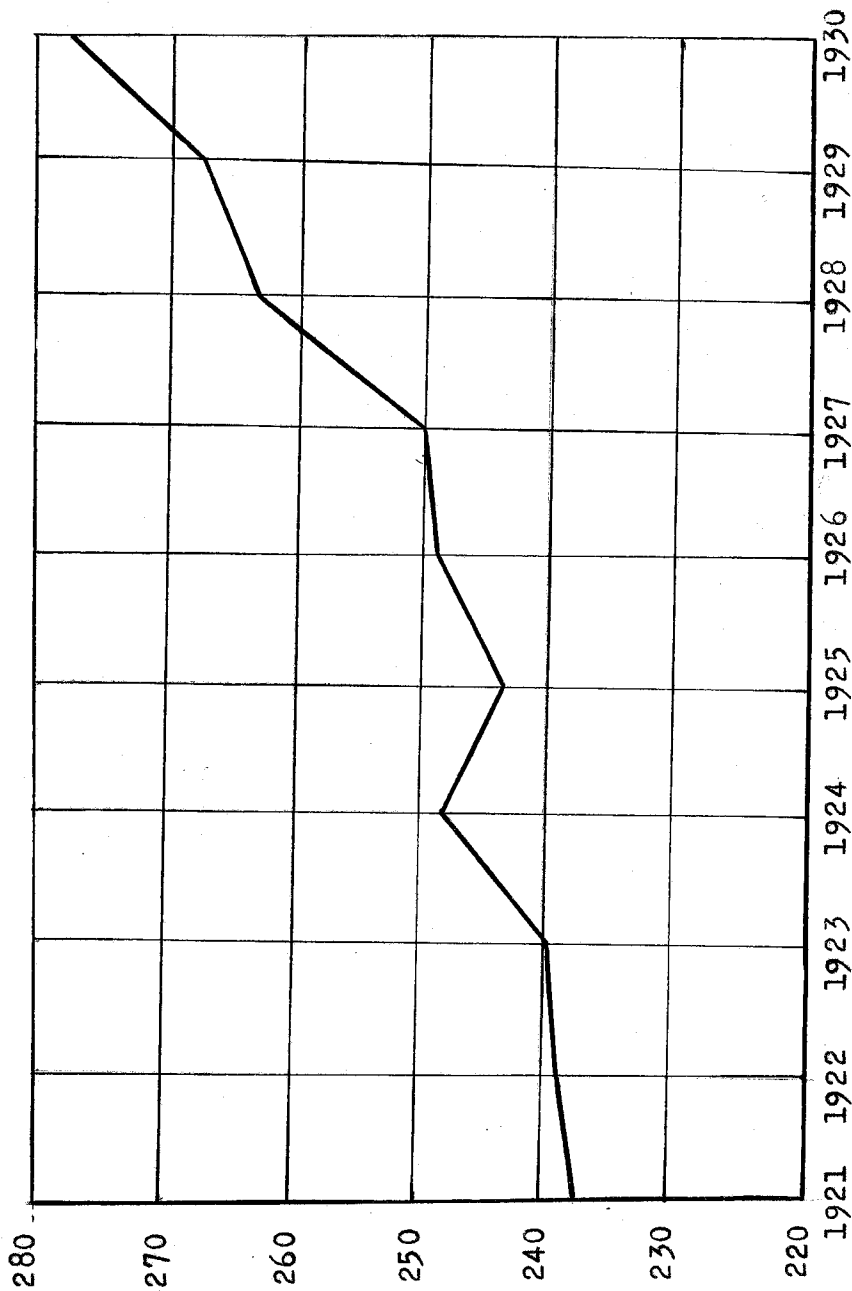
(From Table No. 9, Appendix.)

Fig. 43. Average Number of Pounds of Butterfat Per
Cow Per Year, 1921 - 1930.



(From Table No. 9, Appendix.)

Fig. 44. AVERAGE BUTTERFAT PRODUCTION PER COW ON ALL FARMS, 1921-30.



(From Table No. 10, Appendix.)

average production for the different acreage groups did not vary greatly from this figure. Farms of from 31 to 45 tillable acres had the top figure of 262.92 pounds, while the lowest production of 238.68 pounds was found in the 71 to 100 tillable acre group. These figures are altogether too low. I would suggest that an average production of 300 pounds of butterfat is the minimum which dairy-farmers should maintain if they are to earn satisfactory dividends on their investment. If time had permitted, the writer could have compiled tables from the records of the Farm Survey office to show that there is a very close correlation between operator income and butterfat production. Those farms with a high milk record per cow have almost invariably a high operator income. However, there has been a steady improvement in the butterfat production per cow since the time when the Survey was first started. Fig. 44 shows the gradual upward trend from 1921, when the average for all farms was 237 pounds, to 1930, when the production reached an average of 278 pounds. The increase has been most marked in the last three years. It is to be hoped that the dairymen will maintain, and even accelerate, this increase. It is more essential than ever, now that the price of butterfat has dropped so radically, for the farmers to have a maximum output for every unit of production which they maintain.

(h) Price received per pound butterfat.

Table No. 9 gives the average price per pound butterfat for all farms as being 52 cents. The price received by the farmers on the various acreage groups did not vary appreciably from this figure. It is interesting to note, however, that the medium sized farms received the least for their milk, while the smallest and the largest farms got the best price. Group 1 obtained the top price of 55 cents per pound butterfat. This trend is brought out very clearly in Fig. 50.

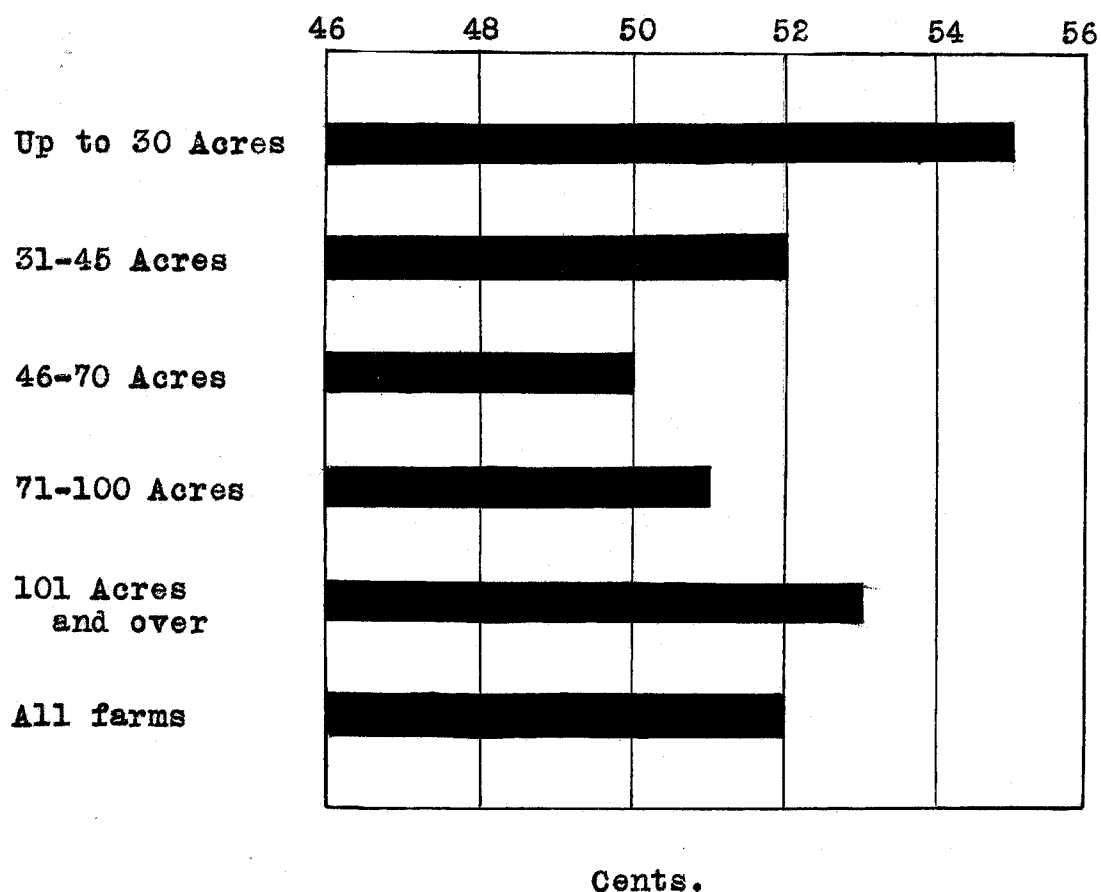
(i) Receipts per cow milk products.

The figures given in Table No. 9 for this item are probably influenced greatly by the butterfat production per cow on the different sized farms. It is true at least, as can be seen by comparing Figs. 43 and 52, that the two groups with the largest production per cow had also the highest average receipts per cow milk products. Group 2 had by far the greatest returns per cow, and obtained \$90 more per cow than the average figure of \$151.10 for Group 1. The three larger groups did not differ greatly in this respect, and averaged about \$125 per cow. On the average, it is evident that the owners of farms of from 31 to 45 tillable acres are the best herd managers.

(j) Cost of production per pound butterfat.

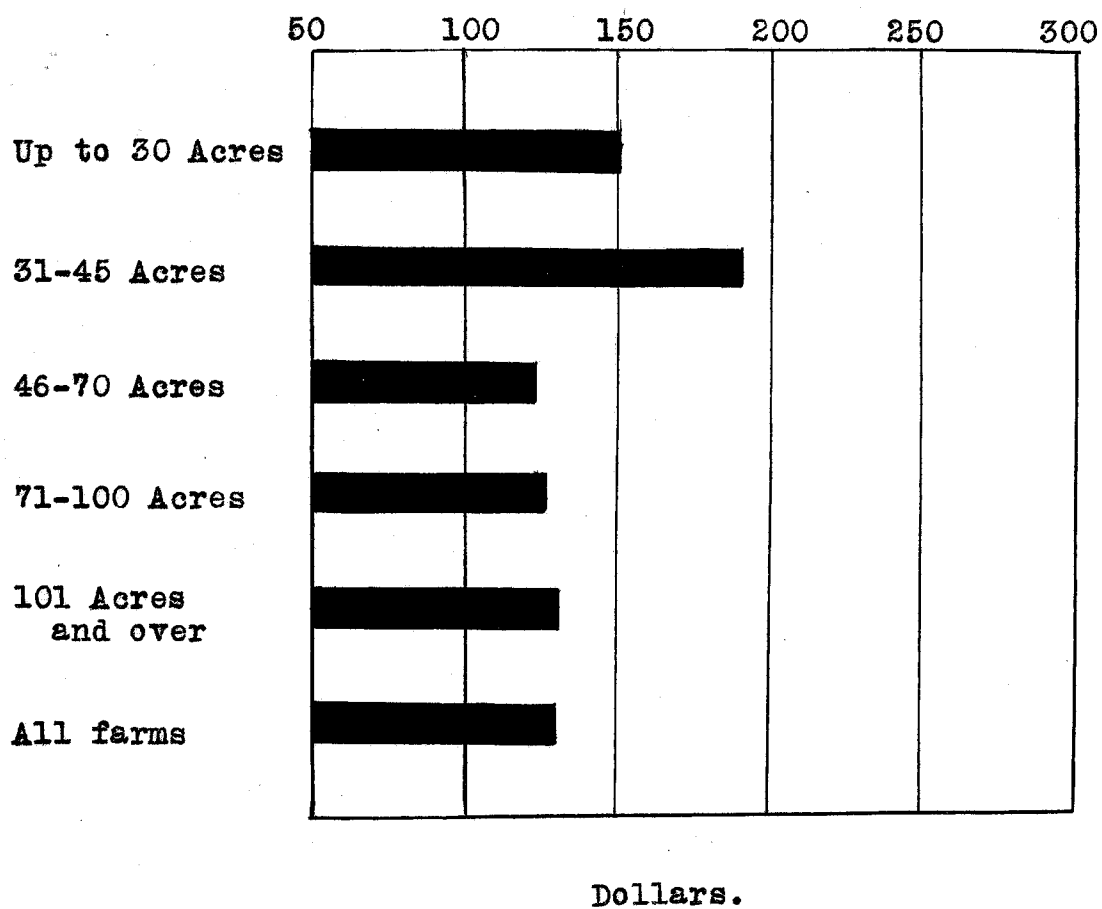
There is a sharp contrast between the trend of cost of

FIG. 50. AVERAGE PRICE PER POUND BUTTERFAT, 1921-30.



(From Table No. 9, Appendix.)

FIG. 52. AVERAGE RECEIPTS PER COW MILK PRODUCTS, 1921-30



(From Table No. 9, Appendix.)

production of butterfat during the last 10 years and the price which the dairymen have received for this product, but this will be discussed later. What strikes the attention first, on comparing the two in Table No. 9, is that the average for all farms gives the cost of butterfat per pound as being 13 cents higher than the selling price. How then, has the dairy farmer been able to carry on for the last ten years? The answer lies in an explanation of the method of determining the cost of production of butterfat.

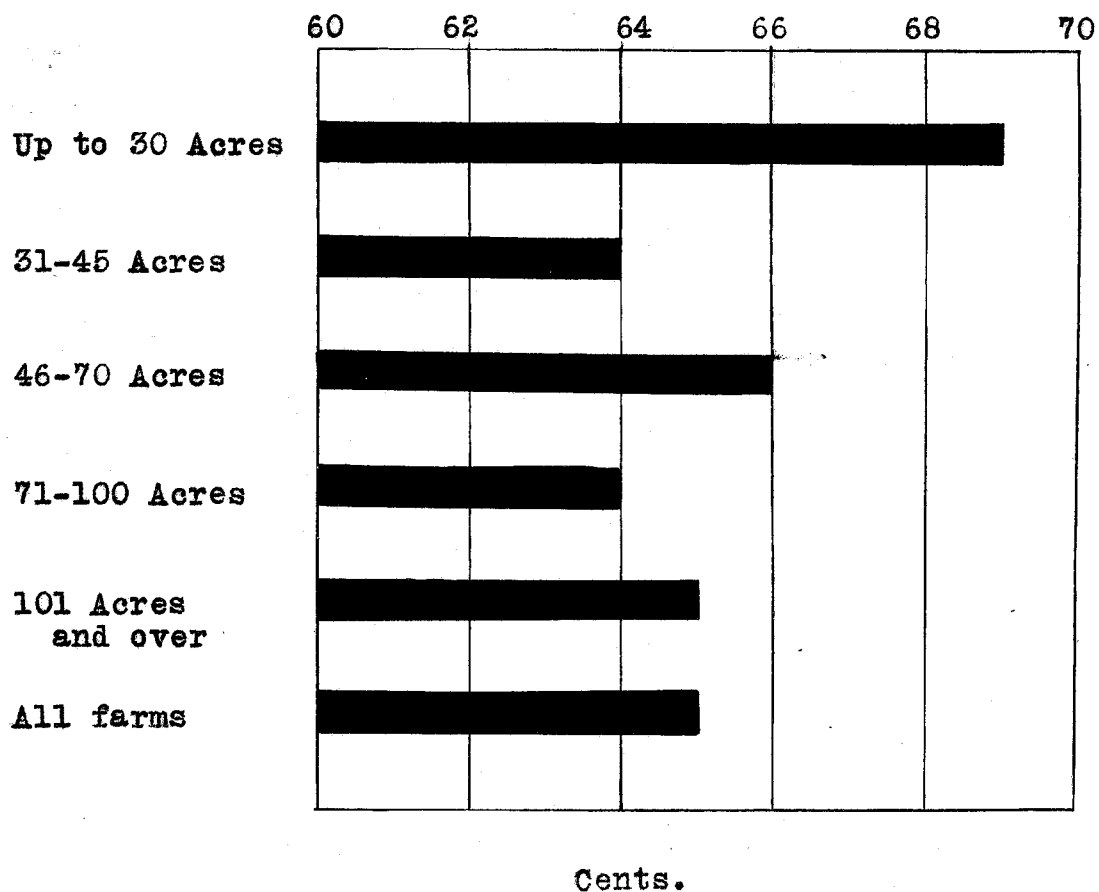
Briefly, the residual method is used in this determination. In the first place, only farms are used which obtain over 50 per cent. of their total farm receipts from dairy cattle. On these farms it is assumed that the various sidelines contribute to the economy of the dairying enterprises. Consequently the net returns from the sidelines are credited to the cows. Then the total farm expense is calculated. This includes current expenses, wages to the operator, and interest on the total farm capital. From the total expenses, the revenue from sidelines is subtracted. This leaves the gross cost of producing butterfat on the farm. The final step is to divide this figure by the number of pounds of butterfat sold during the year, to get the cost of production per pound butterfat.

It will be remembered from the explanation of terms that the total expenses include several items which the individual farmer may not pay. These include wages to the family, and

depreciation. Moreover, the farmer may be satisfied with a lower return on his investment than the 7 per cent. charged against the capital for the purpose of this survey. Consequently, the average production of butterfat is actually lower, and the farmer's income higher, than the figures given in Table No. 9 would indicate. This explains how the dairy-farmer has managed to subsist in spite of the statistical evidence that he is continually selling below cost.

Coming back to the comparison of the acreage groups, we find that the first group had much the highest costs, averaging 69 cents per pound butterfat. The statement that the owners~~af~~ of farms of from 31 to 45 tillable acres were the best herd managers is further substantiated by the fact that they had the lowest cost of production for butterfat, as well as the highest receipts per cow milk products.

FIG. 53. AVERAGE COST OF PRODUCTION PER POUND
BUTTERFAT, 1921 - 30.



(From Table No. 9, Appendix.)

(9)

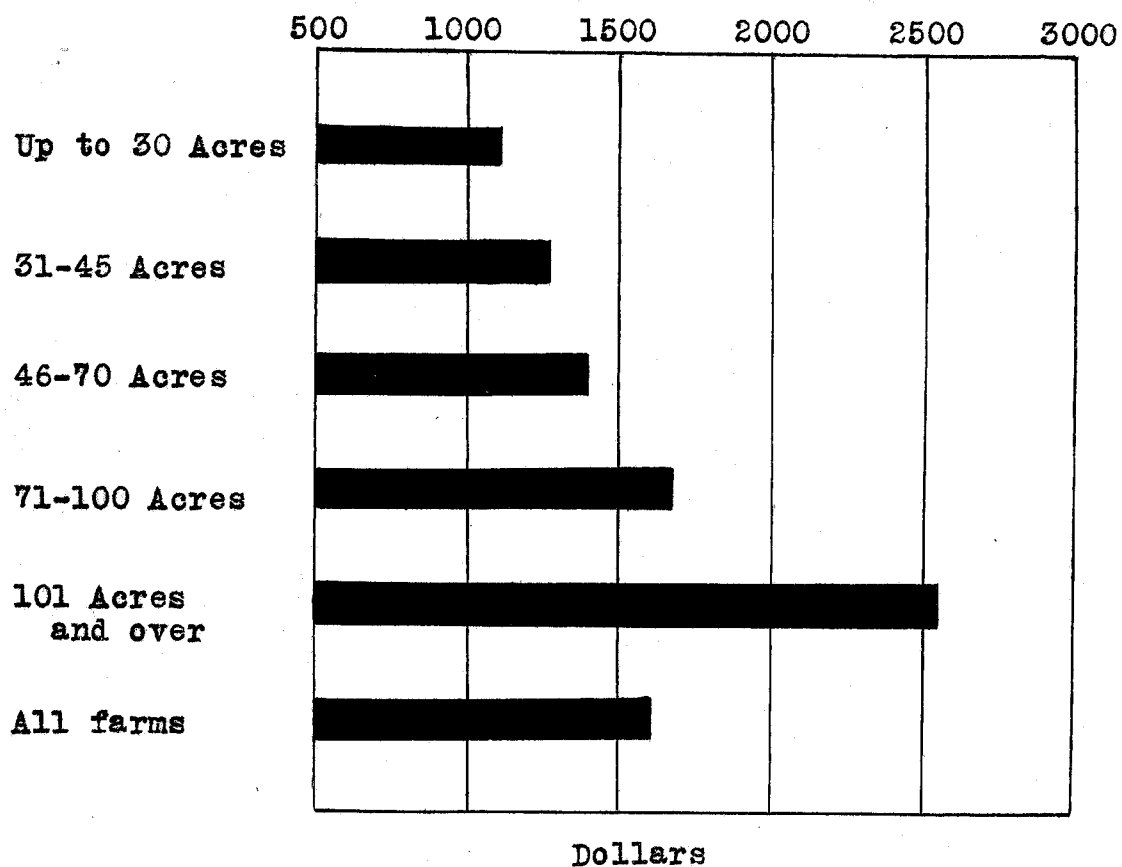
FINANCIAL SUMMARY OF THE FARM BUSINESS.

And now we come to the most interesting part of this study -- the part that indicates the number of dollars and cents that the dairy farmer made, or lost, during the last ten years. The total receipts and the total expenses have already been analysed. The difference between these two is found in order to get the farm net revenue.

(a) The farm net revenue.

To my mind the farm net revenue is the truest yardstick for measuring the profitableness of different-sized farms. It may be assumed that the proportion of borrowed capital does not vary appreciably between acreage groups. Consequently, the larger the average farm net revenue of a group, the better position that group is in. From this viewpoint, a glance at Fig. 55 will indicate that, on the average, the larger the farm a man has, the more money he can make. The farm net revenue for farms under 30 tillable acres was \$1129.63, while the largest group had a revenue of \$2,543.01. The average for all farms was \$1,601.63. The conclusion this leads one to is that the more capital a man has, the better advised he is to buy a large farm. This assumes, of course, that the man has at least average managerial ability.

FIG. 55. AVERAGE FARM NET REVENUE, 1921 - 30.

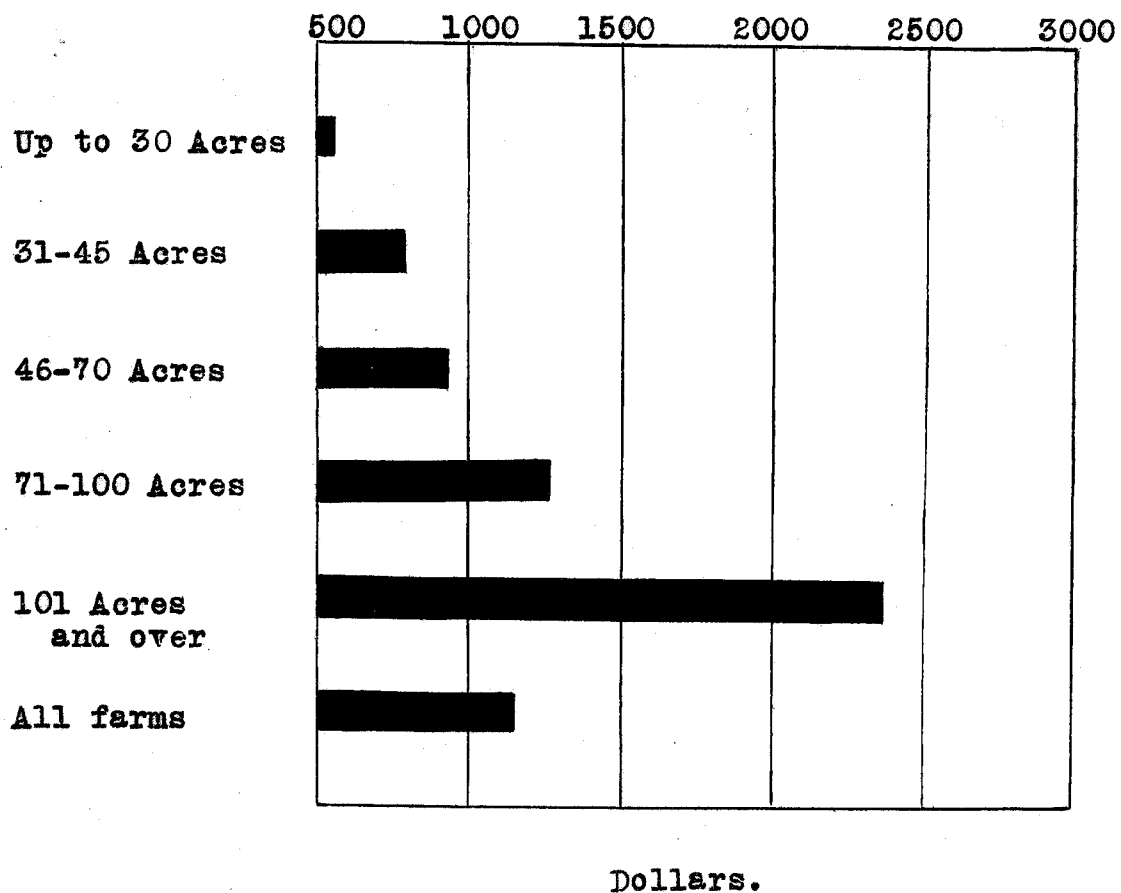


(From Table No. 11, Appendix.)

(b) Interest on the capital at 7 per cent.

As far as the interest payments are concerned, the smaller farms have a very obvious advantage which is well illustrated in Fig. 56. Interest payments only cost Group 1 \$534.33, while the farms of over 100 tillable acres were assessed \$2,378.17 for this item. There was an average interest charge of \$1,165.34 for all farms. I would like to point out, however, that if the farm operator owns his own capital, this interest which has been charged against the farm, goes into his own pocket. The large-farm operator, therefore, does not have to worry very much about the size of his operator income, as long as it is a "plus" figure, since the interest which he obtains is sufficient to give him a very comfortable living. The critics of this idea will probably point out that the farmer would do far better to invest his capital in stocks or bonds and obtain his interest with no effort whatever, if he cannot get a good operator income as well for his 365 days work per year. This is undoubtedly true. However, there are many satisfactions in farm life which might influence a man to stay on the land, operator income or no operator income. And, as far as investments are concerned, it may be well to remind the reader that "easy come easy go"! To get back to facts and figures again, we may observe that the payment of interest on capital at 7 per cent. reverses the trend of advantage between acreage groups which was shown in the chart representing farm net revenue.

FIG. 56. AVERAGE INTEREST ON OPERATOR'S CAPITAL
AT 7%, 1921 - 1930.

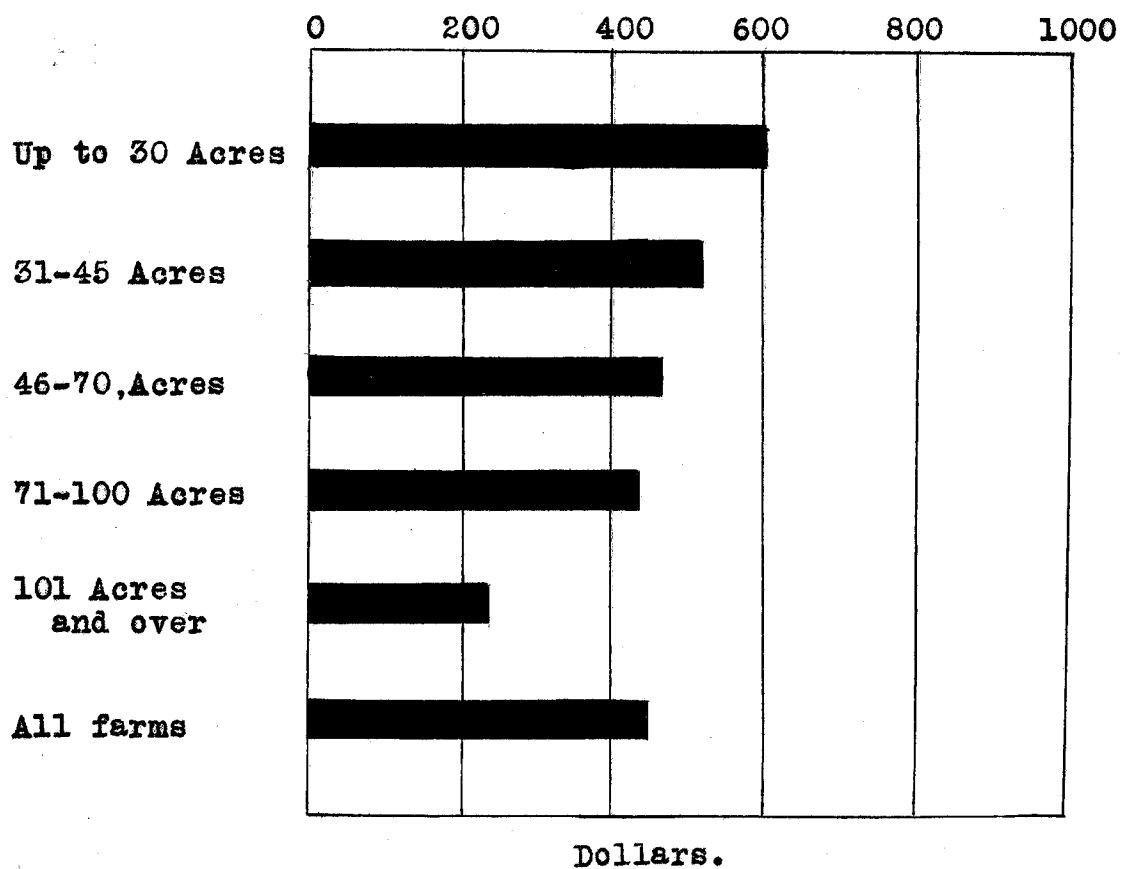


(From Table No. 11, Appendix.)

(c) Operator income.

As a measure of the efficiency of the farm manager, the operator income is ideal. On farms of similar size and capitalization, the amount of the operator income is unexcelled for comparing the ability of the operators. When comparing farms of different sizes and capitalization, however, a new element enters. This element is the fact that it takes a better manager to secure a given operator income on a large farm, where there is a multitude of units to handle, than it does on a small farm where the organization is relatively simple. With this in mind we may analyse the average operator income for the different acreage groups. The ten year average for all farms places the operator income at \$451.38, not a very large figure when one considers the long hard hours a farmer puts in. Group 1 led in operator income with a figure of \$600.62. With an increase in the size of the farms, the income decreased until it was \$233.94 for the farms of over 100 tillable acres. This is just a drop of about \$170, and is not appreciable when one considers the difference in interest on capital between the two groups. It does bring out the fact, however, that the man of average managerial ability and capital will do best to be content with operating a small farm. It is a lot safer in the long run. The large farms may yield very high returns under good management, but, on the other hand, the losses may be excessive if the operator is inefficient. With an average operator income of \$600.62 plus the other factors which make up the "real income," the

FIG. 57. AVERAGE OPERATOR LABOR INCOME, 1921-30.



(From Table No. 11, Appendix.)

owner of the small-sized farms may be sure, at least, of a good living for himself and his family.

(

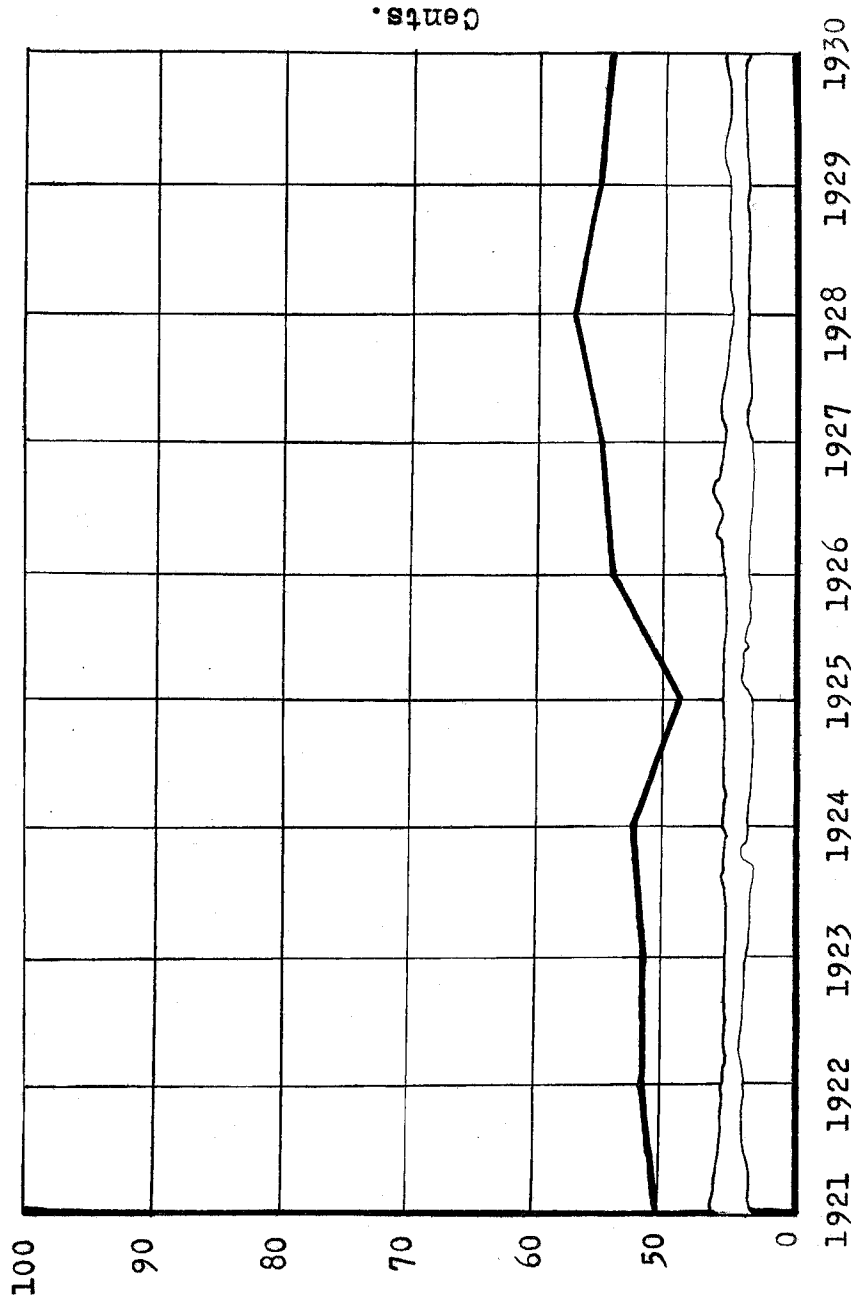
(10) RETURNS PER POUND BUTTERFAT AND OPERATOR INCOME.

To show the relation between cost and selling price of butterfat and operator income, graphs were drawn. These are presented in Figs. 54, 51, and 58 respectively.

The most striking fact which one observes when comparing these charts is the wide fluctuation in the cost of production of butterfat as compared to the relatively constant selling price of this commodity during the last ten years. The cost of production per pound butterfat dropped from 91 cents in 1921 to 65 cents in 1924, a change of 26 cents in three years. The cost remained relatively constant for the next three years, and then started downward again, to reach the lowest figure of the decade in 1929, 50 cents. It will be noticed that 1929 is the only year in the period of the Survey when the selling price for butterfat exceeded the cost price. The most spectacular fluctuation in the cost of production of butterfat took place between 1929 and 1930, when the cost jumped up from 50 cents to 80 cents.

On the other hand, the selling price of butterfat has remained relatively constant. Fig. 51 shows a net increase, during the ten years, of only four cents. The low price was given in 1925, 49 cents, and the high price in 1928, 53 cents. The average for the whole period was 52 cents. This constancy of selling price has probably been due to two main factors.

Fig. 51. AVERAGE SELLING PRICE PER POUND BUTTERFAT ON ALL FARMS, 1921 - 1930.



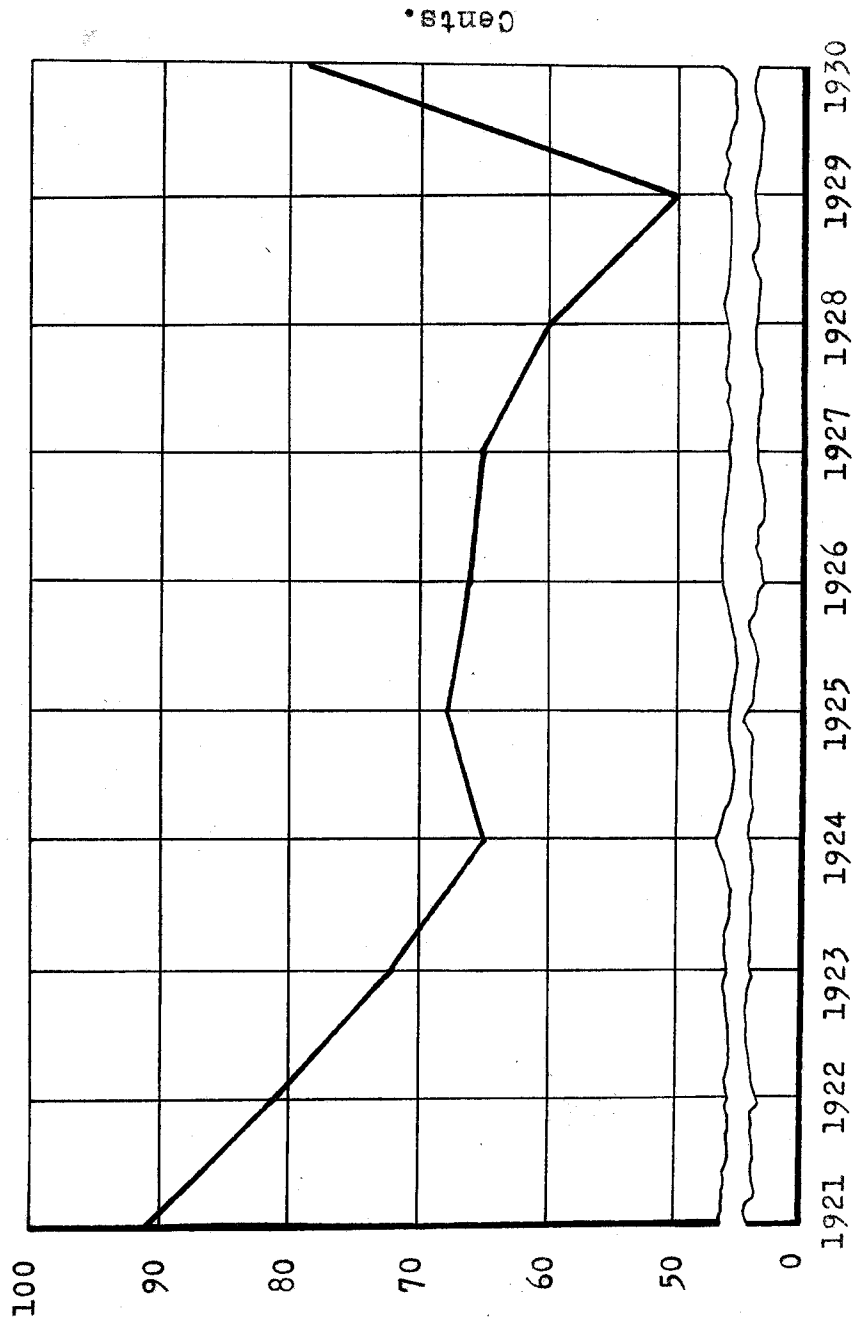
(From Table No. 10, Appendix.)

First, the greatest proportion of the milk is handled by large scale co-operative organizations. The Fraser Valley Milk Producers Association is the outstanding example of such concerns. These associations have undoubtedly played a big part in stabilizing the price of butterfat. The other factor is the importation of butter from outside sources, especially New Zealand and Alberta. This also tends to keep the price uniform, since it causes a constant supply to be maintained.

The second outstanding thing which one notices on comparing these three graphs is that the operator income and the cost of production are practically reciprocals of each other. The highest cost of 91 cents in 1921 is associated with the lowest operator income of -\$208.00 (Table No.10). As the cost decreases, the operator income increases. When the cost started to go up in 1924, the income went down. Then, when the cost started decreasing again, to reach a low of 50 cents in 1929, we find it correlated with the high operator income for the period, \$1,109.00. The correlation is further shown by the big increase in cost associated with the fall of the operator income between 1929 and 1930. These two charts, in a way, are a splendid tribute to the courage and ability of British Columbia dairy-men. Faced in 1921 with high costs due to war time prices and interest rates, and with a minus income due to the sudden fall in prices from 76 cents per pound butterfat in 1919 to 50 cents in 1921, the dairy farmer resolutely set

Fig. 54. AVERAGE COST OF PRODUCTION OF BUTTERFAT ON ALL FARMS

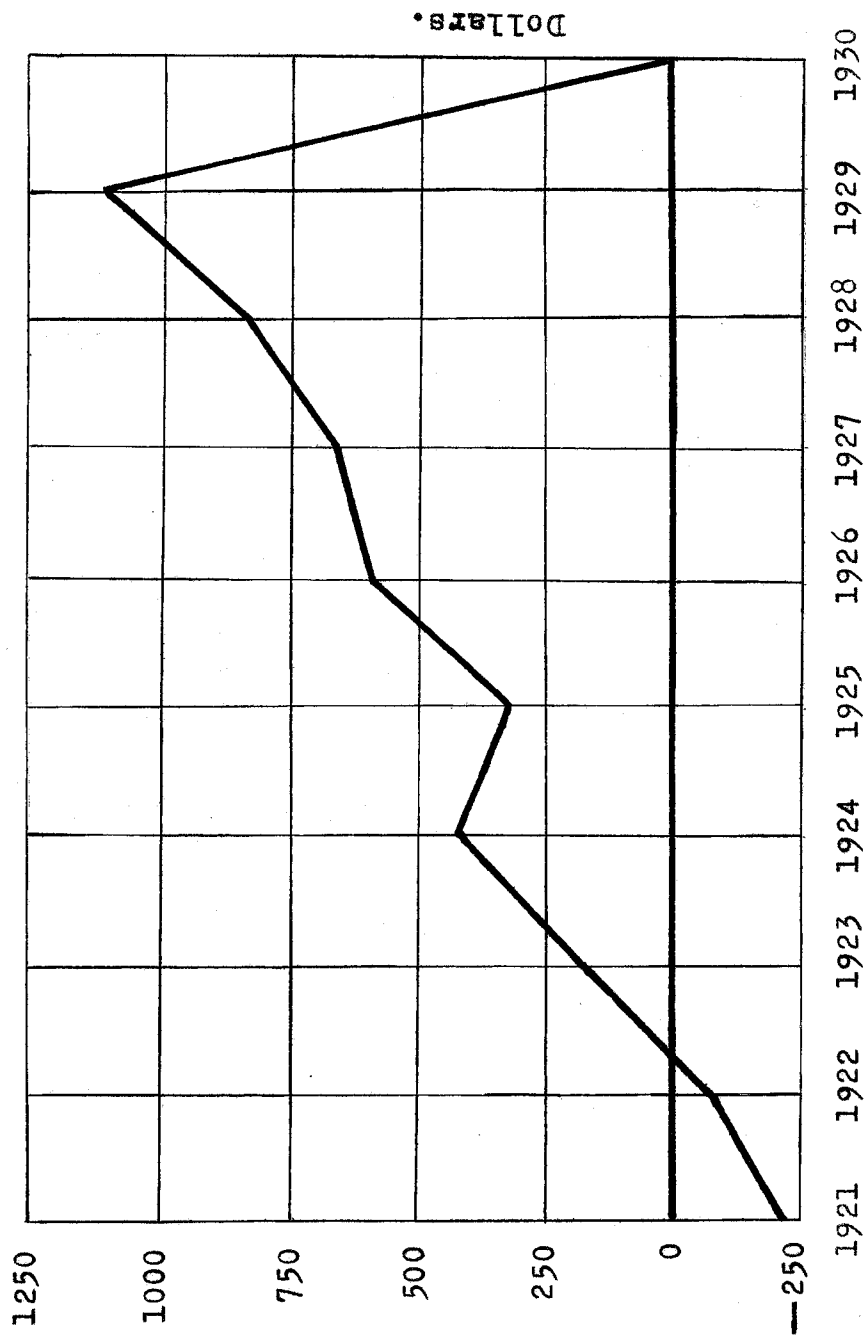
1921 - 1930.



(From Table No. 10, Appendix.)

out to reduce costs. The success of his effort is indicated by the fall in costs of 26 cents per pound butterfat, with a corresponding increase in income. The farmers have persisted in this striving for greater efficiency, and, until just this last year, the costs have continued to go down. It may be observed, however, that there tends to be a slight lag between a change in the operator income and a corresponding change in the cost of production. This is best illustrated by the relatively slower decrease in cost of production of butterfat between 1925 and 1928 when compared to the increase in operator income for the same period. It takes time for the farmer to adjust himself to new conditions.

Fig. 58. AVERAGE OPERATOR INCOME ON ALL FARMS IN THE SURVEY
1921 - 1930.



(From Table No. 10, Appendix.)

(11)

HOW THE BEST FARMERS MADE MONEY.

It is easy to generalize and say that such and such factors make for success in dairy farming. But the farmer is not always very much impressed by theory. He wants to see just how he can gain in dollars and cents by adopting new methods and policies. For that reason the writer has compiled data from the fifty most successful farms on the Survey during the last ten years. One farm was chosen from each acreage group for each year, so that in all, there were ten farms selected from each acreage group.

In studying the different successful farms it was found that there were many items such as the use of the total capital for land, buildings, etc., and the source of the receipts, which varied widely from one farm to another. At the same time, it was seen that there were certain fundamental factors in which the fifty farms were very similar. Accordingly, the figures representing these factors on each of the fifty farms were ~~very~~ averaged, and the averages compared with the averages for all farms in the Survey for corresponding items. The comparison is shown in Table No. 14.

The difference between the two averages for the same factors is so obvious and significant as to require little explanation. However, a brief resumé of the table may be made.

In the first place, the best farms were considerably

smaller, but more highly capitalized per tillable acre than the average farms.

Probably two of the most impressive items are the crop index and the livestock index. The best farms had an average crop index of 131.96 as compared with 102.96 for all farms, and a livestock index of 142.97 as compared with 103.75 for the average farms. High-producing livestock and high-yielding crops are two of the essentials of a good dairy farm. This may be further illustrated by the fact that the average cow on the best farms produced about 75 pounds of butterfat more per year than the average cow on the ordinary farms. Not only were the livestock more efficient on the best farms, but the total number of livestock was greater, as indicated by the fact that the best farms had an average of 36.19 animal units as compared with 27.10 for all the farms.

In the matter of selling price there was little difference between the two averages. The best farms had an advantage of four cents per pound butterfat. The cost of production figures, however, show a big spread. Whereas the average farms produced butterfat at a loss of 13 cents per pound, the best farms made a profit of 17 cents on every pound of butterfat that they sold. Economy of production, associated with high production, are certainly important factors.

I do not believe that the percentage of receipts from the dairying enterprise is very significant. There was a wide

~~mixer~~

divergence in this respect between the different best farms. However, it may be noted that the best farms received an average of 61.41 per cent. of their returns from dairying, while the ordinary farms obtained an average of 50.26 per cent. from this source.

The average gross receipts per tillable acre, and the average total expenses~~per~~ per tillable acre are interesting figures. Both were higher in the case of the best farms. The good farmers spend more in order to make more. However, the spread between expenses and receipts was greater on the fifty successful farms.

The reward for intensive production, for higher production, and for more economical production is very clearly indicated by the farm net revenue. The average of all farms shows a farm net revenue of \$3, 658.47 - just \$2,056.84. more than the ordinary farmers get on the average. Surely these figures are eloquent in themselves. Physical labour is not a factor. The average farmer works just as hard, or harder, than the most successful farmer. The difference lies in the type of organization, the efficiency of production, and that rather indefinite factor called managerial ability, which cannot be expressed in figures.

The only other item of importance is the operator labour income. Since the capitalization of the best farms is greater than that of the average farms, the interest charges are corres-

pondingly greater. This causes the operator income on the best farms to be less in relation to the operator income on the average farms than the farm net revenue would suggest.

There is just one important point to be brought out by a comparison of the operator incomes. In Table No. 13, where the average figures for the ten best farms in each acreage group are given, it is seen that the operator income increased from \$1,701.44, for farms with less than 30 tillable acres, to \$3,168.22 for farms with more than ~~xxx~~ 100 tillable acres. It will be remembered that the operator income on the average farms decreased with an increase in the size of farms. The two trends are exactly opposite. This justifies the conclusion made on page 90 that, if a farmer has more than average ability he can secure the greatest returns by operating a large farm; while the average farmer will do best to devote his efforts to managing a small farm.

Part III

SUMMARY

(12)

Summary

- (1) 1745 farm records were used in this study
- (2) On the average, only 52% of the acreage was made up of productive land.
- (3) The productive land was made up of; crops 38%, pasture 14%.
- (4) Farms of 46-70 tillable acres had the lowest per cent of tillable land to total acreage.
- (5) The larger the farm the more attention is devoted to crop production.
- (6) Medium sized farms did not use as much pasture proportionately, as did the very small or very large farms.
- (7) As the size of the farms increased, the amount of labor applied per tillable acre decreased.
- (8) About twice as many crop acres were associated with one man than were associated with one horse.
- (9) Most of the capital was invested in land. Livestock, farm buildings, house, and machinery were next in importance.

- (10) The larger the farms became, the more important was land as a factor in capitalization. The trend was just opposite for capital in house, farm buildings, and livestock. The medium-sized farms had the greatest proportion of capital in machinery of all farms.
- (11) Half of the total receipts on all the farms were obtained from the dairying enterprise, and one quarter from crops. Miscellaneous sources supplied about one-tenth of the total receipts. Sheep were not raised to any extent on the dairy farms in British Columbia.
- (12) Farms of 31 - 45 tillable acres gave the most attention to the dairying enterprise.
- (13) The percentage of receipts from crops increases as the number of tillable ~~in~~ acres increases.
- (14) Farms of 46 - 70 tillable acres gave the most attention to hog raising.
- (15) With an increase in the size of farms the percentage of receipts from poultry and "miscellaneous" decrease.
- (16) Perquisites contributed \$429.00 on the average, to the farm income.

- (17) There was a decrease in the receipts per tillable acre as the size of the farms increased.
- (18) The dairy-farmer should aim to build up a large volume of business on the acreage he has at his disposal.
- (19) The expenses were just a little less than three-fifths of the receipts on the average.
- (20) The larger farms require more outside labour proportionately than the smaller farms.
- (21) The relative amount of feed bought decreased with an increase in the size of farms.
- (22) Total expenses per tillable acre decreased with an increase in the size of the farms.
- (23) Farms having 31 - 45 tillable acres had the most efficient crop production. Group (3) had the lowest crop index.
- (24) The smallest farms were the most efficient livestock raisers.
- (25) The total animal units per farm increased with an increase in the size of the farms. However, the

- (25) number of animal units per tillable acre was greatest on the smallest farms.
- (26) The largest and the smallest sized groups received the highest gross return per animal unit.
- (27) There was an increase in the number of cows per farm as the size of the farms increased.
- (28) Farms of 31 - 45 tillable acres had the highest average butterfat production per cow.
- (29)
- The average butterfat production per cow for all farms is too low, but is improving steadily. 300 pounds per cow per year should be the minimum.
- (30) The average price received per pound butterfat was 52¢. It did not fluctuate very much from year to year.
- (31) Owners of farms with 31 - 45 tillable acres received the greatest receipts per cow for milk products, and at the same time had the lowest cost of production per pound of butterfat.
- (32) The cost of production of butterfat fluctuated widely during the last ten years. It averages 65¢ per pound

- (32) --13¢ higher than the average selling price.
- (33) From the standpoint of farm net revenue, the larger farms have an advantage. When interest is deducted from the farm net revenue, the operator income obtained decreases with an increase in the size of farms.
- (34) The average operator income for all farms is too low to provide an adequate return for the farmers efforts.
- (35) Cost of production and operator income are reciprocals of each other, with a slight lag between changes in the former behind changes in the operator income.
- (36) The best farms were smaller but more highly capitalized per tillable acre than the average farms.
- (37) The crop index and the livestock index on the best farms were much higher than on the average farms.
- (38) The best farms had a higher production of butterfat per cow, and a lower cost of production per pound butterfat than the average farms.

(39) Both receipts and expenses per tillable acre were higher on the best farms than on the ordinary farms.

(40) As a result of these factors, the best farms had an average operator income of over four times the operator income on the average farms.

(41) On the best farms, the average operator income increased as the farms increased in size. The reverse was true in the case of the ordinary farms. The average farmer can do best by operating a small farm, while the farmer with better than average ability can make more money by operating a large farm.

Part IV

APPENDIX

Table No. 1.

AN ANALYSIS OF THE ACREAGE, 1921-30.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	100 up	All farms
Group No.	1	2	3	4	5	6
Number of farms	333	335	380	366	331	1745
Actual acres	44.33	78.89	125.43	162.66	287.97	139.66
Tillable acres	21.80	37.71	56.53	83.53	167.38	73.71
Crop acres	15.38	26.76	43.33	60.23	125.17	53.88
Tillable area of pasture	6.35	11.01	14.78	23.08	44.51	19.83
Crop acres per man	11.1	16.19	22.48	27.69	41.51	23.80
Crop acres per horse	8.41	10.56	15.01	17.38	23.03	14.91

Table No. 2.

AN ANALYSIS OF THE ACREAGE, EXPRESSED IN

PERCENTAGES, 1921 - 1930.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
Crop acres	34.69	33.92	34.54	37.02	43.47	38.58
Tillable area pasture	14.32	13.96	11.78	14.19	15.47	14.20
Unproductive land	50.83	52.20	54.93	48.65	41.88	47.22
Total acreage	100.00	100.00	100.00	100.00	100.00	100.00

Table No. 3.

AVERAGE CAPITALIZATION OF THE DAIRY FARMS, 1921 - 1930.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
Capital in land	3787.16	5718.00	7421.10	10,802.52	21,721.45	9771.82
Capital in house	1124.90	1476.79	1312.25	1,296.08	1,754.56	1388.59
Capital in farm buildings	902.70	1399.50	1361.20	1,648.08	2,868.38	1627.00
Capital in livestock	1131.03	1510.86	1913.02	2,381.94	3,773.02	1249.24
Capital in machinery	579.98	860.72	1085.38	1,423.91	2,310.76	2137.81
Capital in feed and supplies	45.16	121.90	122.02	277.46	548.02	219.82
Total capital	7569.87	11116.86	13236.18	17829.92	32,016.60	16273.88
Capital per tillable acre	356.08	314.23	248.55	250.66	256.34	277.72

Table No. 4.

FACTORS MAKING UP THE TOTAL CAPITALIZATION, EXPRESSED IN PERCENTAGES.

AVERAGE OF FIGURES FROM 1921-30.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
Capital in land	50.03	51.44	56.07	60.59	65.87	59.61
Capital in house	14.86	13.28	9.99	7.27	5.32	8.47
Capital in farm buildings	11.92	12.59	10.28	9.24	8.70	9.92
Capital in livestock	14.94	13.59	14.45	13.36	11.44	13.04
Capital in machinery	7.65	7.92	8.29	7.99	7.01	7.62
Capital in feed and supplies	.60	1.18	.92	1.55	1.66	1.34
Total Capital	100.00	100.00	100.00	100.00	100.00	100.00

Table No. 5.

AVERAGE GROSS RECEIPTS PER FARM AND THE AMOUNT OF SUCH THAT

COME FROM DIFFERENT SOURCES, 1921-30.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
Receipts from dairy	1140.67	1544.35	1590.62	2119.43	3089.55	1891.11
Receipts from crops	230.05	456.57	610.83	1118.61	2367.47	948.26
Receipts from hogs	109.48	155.66	233.24	219.24	283.29	201.29
Receipts from poultry	337.64	281.67	238.50	190.13	426.77	291.27
Miscellaneous receipts	411.02	428.98	412.82	364.89	546.40	430.92
Total Receipts	2236.38	2898.60	3142.90	4139.81	7061.28	3875.36
Gross receipts per tillable acre	95.04	78.78	54.90	49.50	41.68	62.77
Perquisites	350.59	392.44	421.12	431.50	554.40	429.62

Table No. 6.

SOURCES OF RECEIPTS EXPRESSED AS PERCENTAGES OF THE GROSS RECEIPTS

1921 - 1930.

Acreage group	1-30	31 - 45	46 - 70	71 - 100	101 up	All farms
Receipts from dairy	51.05	53.78	50.63	51.29	44.75	50.26
Receipts from crops	10.29	15.75	19.43	27.22	34.50	25.20
Receipts from hogs	4.88	5.87	7.42	6.29	5.01	5.35
Receipts from poultry	15.40	9.72	7.59	5.59	7.03	7.74
Miscellaneous receipts	18.36	14.88	14.93	9.81	8.71	11.45
Total Receipts	100.00	100.00	100.00	100.00	100.00	100.00

Table No. 7.

AVERAGE GROSS EXPENSES PER FARM AND THE AMOUNT OF SUCH THAT COME

FROM DIFFERENT SOURCES, 1921 - 1930.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
Family and hired labor	235.75	452.36	575.53	856.14	1609.43	742.02
Feed bought	399.13	405.15	340.32	340.08	559.27	405.47
Depreciation (Buildings and machinery)	166.28	238.18	254.64	311.61	499.22	291.63
Miscellaneous	305.78	515.16	581.74	945.11	1850.14	834.48
Total expenses	1106.94	1610.85	1752.23	2452.94	4518.06	2273.60
Total Expenses per tillable acre	50.78	42.71	31.00	29.36	26.99	30.84

Table No.8.

SOURCES OF EXPENSES EXPRESSED AS PERCENTAGES OF THE

TOTAL EXPENSES, 1921 - 1930.

Acresage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
Family and hired labour	21.30	28.08	32.84	34.90	35.62	32.64
Feed bought	36.05	25.15	19.42	13.86	12.37	17.83
Depreciation (Buildings and machinery)	15.02	14.78	14.53	12.70	11.05	12.83
Miscellaneous	27.63	31.99	33.21	38.54	40.96	36.73
Total expense	100.00	100.00	100.00	100.00	100.00	100.00

Table No. 2.

EFFICIENCY FACTORS

AVERAGE OF FIGURES FROM 1921-30.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
Crop index	102.47	105.36	99.13	102.58	103.91	102.96
Livestock index	124.97	108.42	95.46	95.54	96.27	103.75
Total animal units	14.6	20.45	24.56	30.22	45.91	27.10
Ave. no. tillable acres per animal unit	1.49	1.84	2.30	2.76	3.64	2.72
Gross receipts per animal unit	\$153.18	141.74	127.97	136.99	153.81	143.00
Number of cows	7.33	9.81	11.04	14.53	20.65	12.65
Lbs. butterfat per cow	260.17	262.92	250.35	238.68	250.13	252.15
Price received per lb. b.f.	\$.55	.52	.50	.51	.53	.52
Receipts per cow milk products	\$151.10	241.21	123.03	125.91	131.28	130.76
Cost of producing one pound of butterfat	\$.69	.64	.66	.64	.65	.65

Table No. 10.

TREND OF BUTTERFAT PRODUCTION AND SALE IN RELATION TO THE OPERATOR INCOME.

Year	Butterfat C.P.	Butterfat S.P.	Gain or Loss Per Lb.	Operator Income	Butterfat Production Per Cow
1921	\$.91	\$.50	-\$.41	- \$208	237
1922	.81	.51	- .30	- 60	239
1923	.72	.51	- .21	- 178	239
1924	.65	.52	- .13	413	248
1925	.68	.49	- .19	315	243
1926	.66	.54	- .12	580	249
1927	.65	.55	- .10	651	250
1928	.60	.57	- .03	835	264
1929	.50	.55	- .05	1109	268
1930	.80	.54	- .26	172	278
Average	.65	.52	- .13	451	252

Table No. 11.

FINANCIAL SUMMARY OF THE FARM BUSINESS

1921 - 1930.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
Total receipts	2236.38	2898.60	3142.90	4139.81	7061.28	3875.36
Total expenses	1106.94	1610.85	1752.23	2452.94	4518.06	2273.60
Farm net revenue	1129.63	1287.64	1390.58	1686.52	2543.01	1601.63
Interest on cap. at 7%	524.33	773.23	926.63	1249.13	2378.13	1165.34
Operator Labour Income	600.02	514.41	466.65	438.38	233.94	451.38

Table No. 12.

AVERAGE OPERATOR INCOME, 1921-30.

Acreage group	1 - 30	31 - 45	46 - 70	71 - 100	101 up	All farms
1921	187.94	--62.31	-563.28	-334.32	-1012.27	-208.80
1922	198.65	206.62	-109.25	38.04	- 802.40	- 60.00
1923	521.69	460.07	15.40	35.90	- 236.64	178.00
1924	702.00	361.00	203.00	498.00	274.00	413.00
1925	672.00	418.00	311.00	178.00	- 265.00	315.00
1926	766.71	581.15	603.74	590.73	249.86	580.00
1927	750.13	682.20	708.08	631.20	474.20	651.00
1928	863.65	905.44	857.89	685.18	847.58	835.00
1929	794.10	884.69	980.42	1129.80	1611.41	1109.00
1930	429.38	517.60	476.28	109.86	- 500.70	172.58
Average	600.62	514.41	466.65	438.43	233.94	451.38

Table No. 13.

AVERAGE OF TEN BEST FARMS IN EACH ACREAGE GROUP.

Item	1 - 30	31 - 45	46 - 70	71 - 100	101- up
Tillable acres	23.90	41.48	53.82	87.80	198.70
Total cap./till. acre	\$429.41	374.03	386.58	333.78	275.03
Crop index	116.00	129.90	135.40	136.40	142.10
Livestock index	176.40	134.22	152.90	124.65	126.70
Total animal units	21.02	30.67	32.46	35.90	60.91
Lbs. of b.f. per cow	327.00	349.50	350.60	310.30	303.90
Selling price/lb. b.f.	70.2¢	52.44	53.24	53.10	52.10
Cost price/lb. b.f.	54.11	34.33	34.51	43.50	30.55
Dairy diversity index	63.67%	66.40	67.20	53.85	55.93
Gross rec./till. acre	\$121.13	111.82	100.42	77.90	61.27
Total expenses	\$1754.96	2214.31	2180.13	3375.33	5658.34
Total exp./till. acre	73.43	53.38	40.51	38.44	28.48
Farm net revenue	\$2425.29	2753.66	3340.73	3622.96	6149.73
Interest at 7%	\$ 723.74	851.38	1366.51	1436.63	2974.50
Operator income	\$1701.44	1902.28	2059.02	2220.33	3168.22

Table No. 14.COMPARISON OF 50 BEST FARMS WITH THE AVERAGE.

Item	Average of All farms	Average of 50 Best farms
Tillable acres	139.66	81.14
Total capital per tillable acre	\$ 277.72	\$ 359.77
Crop index	102.96	131.96
Livestock index	103.75	142.97
Total animal units	27.10	36.19
Pounds of butterfat per cow	252.15	328.26
Selling price per lb. B.F.	.52	.56
Cost price per lb. B.F.	.65	.39
Dairy diversity index	50.26%	61.41%
Gross receipts per tillable acre	\$ 62.77	\$ 94.50
Total expenses per tillable acre	\$ 30.84	\$ 46.85
Farm net revenue	\$1601.63	\$3658.47
Interest on capital at 7%	\$1165.34	\$1470.55
Operator labour income	\$ 451.38	\$2210.26