M. Milliken.

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"A SURVEY OF CERTAIN ASPECTS OF THE SHAED-MILKING INDUSTRY IN THE WAIKATO, 1945/46"

Being a Thesis presented by "547" in partial fulfilment of the requirements of the M. Ag. Sc. Degree.

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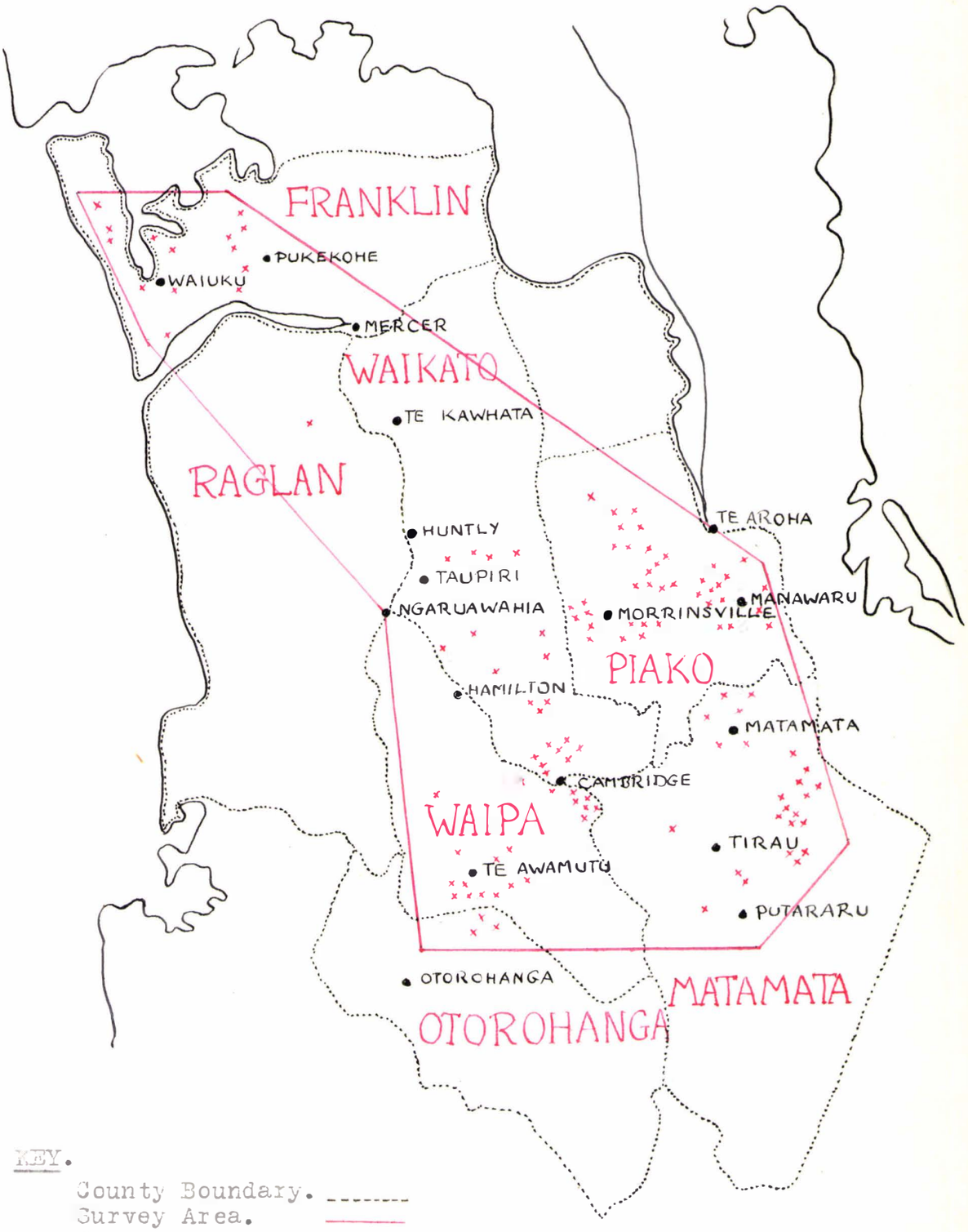
Map No. I

LOCALITY OF THE FARMS UNDER SURVEY



KEY.

County Boundary. --------
Survey Area. ————
Towns. •
Farms Surveyed. ×

TABLE OF SYMBOLS USED IN THE STATISTICAL SUMMARIES

The symbols used in depicting the results of statistical analyses are principally those used by Snedecor (7). They are as follows:-

Symbol	Description
X	Every item successively.
SX	"Summation X".
N	Total number of items.
n	Number of items in each class or group (Sn equals N)
$\bar{x}$	The arithmetical mean.
s	Standard Deviation.
x	Deviation of an item from the class mean.
$s/\bar{x}$	Coefficient of Variation.
$s_{\bar{x}}$	Standard error of the mean.
s_s	Standard error of the standard deviation.
t	Student's (t) test of significance of mean difference.
s_t	Standard error of "t".
r	Total correlation or product moment correlation.
F	Fisher's "F" test of the differences among group means.
SS	Sum of the squares.
MS	Mean square or variance.
Sign, NS	Not significant at the 5% level.
S	Significant at or above the 5% level.
HS	Significant at or above the 1% level.
df	Degrees of freedom.
C	Correction factor $\left(\frac{(SX)^2}{n} \right)$
B, C, D.M.	Butter, Cheese, Dried Milk factory supplying farms respectively.
1/4, 1/3, 1/2.	Farms on which the type of share milking contract in operation is commonly known as Quarter-Share, Third-Share and Half-Share respectively.

PART I.

PRELIMINARY

PART I

SECTION I

INTRODUCTION AND REVIEW OF THE LITERATURE

Associated with the outstanding development of the dairy industry in New Zealand over the years of this century has been the rapid growth of that section of dairying known as share-milking. The term 'share-milking', in this country, applies to that type of dairy farm labour, the wages for which are based upon some proportion of the proceeds of the sale of farm produce. This general definition covers in New Zealand three principal systems of share-farming:

(a) 'Quarter share-milking', where the farm owner supplies the land and capital (including the herd) and the share-milker supplies only the labour required for the milking and care of the stock. He does not do general farm maintenance except for added remuneration and received, at the time to which this study applies, 27½% of the proceeds of the sale of dairy products and half the proceeds of the by-products.

(b) 'Third share-milking, where the farm owner supplies the land and capital (including the herd) and the share-milker provides the labour for, and does, the general farm maintenance in addition to the milking and care of the stock. His share of the receipts was (at the time to which this applies) 36-2/3% of the dairy cheque and half the proceeds from the sale of by-products.

(c) 'Half share-milking', where the farm owner supplies the land and fixed capital and the share-milker supplies the herd in addition to all the farm labour. He generally receives half the dairy cheque and half the proceeds from the sale of by-products. This division may be, and often is, varied as there is no Statutory Regulation for this type of agreement. See Appendix II for the regulations covering the proportionate receipts and payments of each of the two parties under the first two types of agreement. A popular half share agreement is also appended.

The earliest record of share-milking in New Zealand relates to the Henley Land Coy. on the Taieri, where Mr. J. Stevens introduced the system

in 1884 (I). Towards the end of the last century this system was being used in Taranaki - it is recorded as being used by Mr. Chew Chong as early as 1887 (I) - and from this it spread to the Manawatu. About the close of the 1914-18 War the main centre of share-milking began to transfer to the Waikato. At the same time half share-milking, aided by the various Stock and Station Agencies, was established. Since then all three systems have found ever wider application, until today their importance in thedairy industry can be gauged both from the number of farms on which share-milking is practised and from the effects of the current disputes between the parties involved.

It is very difficult to get an accurate and up to date approximation of the number of 'share-milking farms', but estimates (N.Z. Workers' Union and Federated Farmers of N.Z. Inc., private communications) would appear to place this near the four thousand mark. The total number of dairy factory suppliers for the season 1945/46 was 56,225 (2) of which number probably fifteen thousand did not rely on the sale of dairy produce for their main source of income. If this estimate is true, it would appear that herds milked by share-milkers form about ten percent of the total full-time suppliers. Doig (3) estimated the figure as at eleven percent but his sample was one of larger than average farms. Both estimates would need to be reduced to apply to all herds. The Government Statisticians survey in the 1935/36 season (2) places the proportion of all farms where share-milkers are employed, but where the owner is non-resident, at three point seven percent. If non-resident owners are found in about half the cases (page 4.9) then the proportion of <u>all</u> dairy farms on which share-milking is practised is in the region of seven percent. This figure checks with the N.Z.W.U. and F.F. of N.Z. estimates above.

Share-milking has in the past been subject to but scant attention in New Zealand literature. This can be attributed to lack of official data, to lack of investigational work and to lack of appreciation of the importance of share-milkers as a tenancy group. Published information is, for all practical purposes, confined to that found in 'The Dairy Industry in N.Z.' - Hamilton; 'Standards of Life of Dairy Farmers in New Zealand' - Doig; 'New Zealand Official Year Book, 1938' - Government Statistician; and to brief mention in "A History of the New Zealand Dairy Industry" - Phillpot. Unpublished

information is confined to "Dairy Farming in the Waikato" - Stephens, an unpublished M.A. thesis; to "The New Zealand Dairy Industry", Belshaw, an unpublished M.A. thesis; and to evidence placed before the Court of Arbitration, Wellington, in April 1946 by both the New Zealand Farmers' Union and the New Zealand Workers' Union.

Hamilton (4) confines himself to a brief review of two systems of share-milking, and to an estimate of the possible percentage of farms where these systems are practised. Doig (3) refers to some of the more sociological aspects of this form of tenure and makes an estimate of the percentage of farms in which share-milkers are employed. The Government Statistician (2) gives figures for the percentage of all dairy farms on which share milkers are employed and on which the farm owner non-resident, while Phillpot (1) mentions the earliest recorded use of share-milking in New Zealand. Stephens (6) comments on the fact that there are two major types of share contract, both of which have been associated with compulsory purchasing clauses. Furthermore he refers to the general disadvantages of metayer tenancies (15) and attributes the rise of share tenancy to land aggregation and the retirement of farm owners. He is the first writer to mention the rise of a share-milking class or rural proletariat.

Both the N.Z. Farmers' Union and the N.Z. Workers' Union in their evidence before the Court of Arbitration in Wellington (14) attempted to determine the incomes accruing to sharemilkers. These two organisations were the first to approach the subject of share-milkers with any degree of analytical method. The former organisation relied upon the results of a survey of a number of farms in the Waikato to illustrate the good economic position of share-milkers relative to their employers. The latter organisation relied upon a break up of the Guaranteed Price to show the reverse.

The present study goes somewhat further than either of these and is an attempt to apply statistical analyses to data collected by means of a survey.

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S E C T I O N II

SCOPE AND METHOD

Scope.

The scope of the following analysis is of necessity somewhat limited. It may be broadly classified into three sections:-

(a) a study of the size of, the production on and the capital investment in a sample of farms located in the Waikato area and on which share-milkers were employed during 1945/46.

(b) a study of some of the factors which influenced the economic reward accruing to the farm owner and the share milker for capital invested, management exercised and labour performed on these same farms.

(c) a study of some of the characteristics of labour utilisation on these same farms.

Except for data relating to the standard of housing (see p.9.) and to the length of tenure (see p.55) no information of a socialogical nature was collected, and no conclusions of a socialogical nature are intended. Nor was data collected with the object of drawing comparisons between the incomes of sharemilkers and their employers. In fact it was in several instances a condition that was demanded before information would be supplied. Employer-employee analyses have therefore been avoided.

Method.

The investigation was carried out in three definite stages. The first was preparatory, the second the collection of the data and the third the analysis of the data. Each of these requires some explanation as each is subject to certain limitations affecting the final results.

(a) Preparatory.

The schedules of information sought (see appended copy in Appendix I) were drawn up early in 1946 and were based upon those used by Fawcett (5) and Doig (3) and incorporated the provisions of the Share-milking Agreement Order 1937 and its amendments. The schedules of information required, therefore, refer only to the farm owner's share of the farm receipts and expenses and to the

share-milker's receipts and expenses respectively. Both schedules were so designed that they would cover variations in receipts and expenses due both to the type of contract and to the type of factory supplied. It was not anticipated, and this happened to be the case, that all the items as listed would be answerable in detail. The schedule was drawn up in detail, however, in case some person provided data one way and others in a different way. This also proved to be the case.

During the May vacation of 1946 a trial investigation, aimed at testing the coverage of the schedule, the availability of the data and the technique of collection, was carried out in the Manawatu district. In this investigation data was collected from 18 farms and as a result of this work the schedule was modified slightly to its present form. The information collected at this time, however, is not included in the general analysis because of the different location of the farms in question. Despite this non use of the data, however, the preliminary investigation proved to have been of considerable value as it resulted in modification of the schedule as well as giving experience in the practice of data collection. In deciding upon the Waikato as the locality of the main investigation, account was taken of the importance of that area as far as share-milking is concerned, and of the fact that though Taranaki contains a considerable number of share-milking farms, there was a likelihood of there being some difficulty in obtaining sufficient butter supplying farms and sufficient half-share-milking farms.

In deciding upon the number of farms (i.e. the number of farm owners and the number of share-milkers) to be investigated, account was taken of the types of share-milking agreements in operation and of the types of factory supplied by the farms, as well as considerations of the statistical reliability of the results (7). The number finally decided on was 125 owners and 125 share-milkers as a minimum and more to be done if possible. This was to allow for rejection of data for unreliability. The farms were to be divided into six groups of twenty as shown in Table I. It was intended to include, if possible, some farms supplying dried milk factories, but the main object was to study the effect of the type of contract on the tenure groups. As will be seen later, (p.7.) this plan had to be somewhat modified on account of the structure of the share-milking industry in the area investigated.

Table I. Intended subdivision of the sample.

		Farm Owner			Share-Milker		
Contract		1/4	1/3	1/2	1/4	1/3	1/2
Supply	Butter	20	20	20	20	20	20
	Cheese	20	20	20	20	20	20

In order that a sufficient number of "contacts" be made prior to the period of data collection, a number of dairy company secretaries were approached and asked to provide lists of the names of suppliers who, to their knowledge, were employers of share-milkers. In this way the names and addresses, as well as the approximate locality and type of supply of their farms, of approximately 170 employers of share-milkers were obtained. The disadvantages of such a method of approach are mainly that in many cases the share-milkers have left the farm in question. Furthermore it was not possible, except in a few cases, to know in advance the type of agreement in operation on the farm. The advantages are those of speed and representativeness as the farms supplied by the companies were obviously not selected all for high standard or all for low standard.

(b) Collection of the Data.

The information contained in this analysis was collected by the "survey" method which, though it has the disadvantages of lack of accuracy in detail, has the advantages of wide application. The greater number of farms capable of being surveyed in the time available tends to reduce any irregularities of the individual figures. In each case the farm owner and the share-milker was visited personally and data supplied by each was, with the exception of a few cases, drawn from income-tax returns. Where the parties were not able to supply all the required information themselves they gave permission for it to be supplied by their accountant or their solicitor.

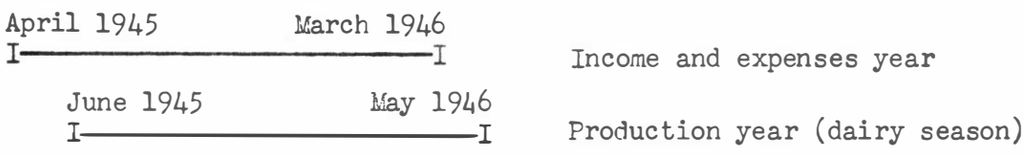
The survey was carried out during the period mid-November 1946 to mid-March 1947, and the area shown on map No.1. The number of farms visited in each county is as follows:-

Franklin	 14	Raglan	 1		
Waikato	 20	Piako	 44		
Waipa	 20	Matamata	 24		
Otorohanga	 3			Total	 126

The above table does not mean that 126 farm owners and 126 share-milkers from 126 farms supplied data. Owing to the shifting of some share-milkers, the inaccessibility of some owners and the lack of co-operation of a very few owners and milkers, it was not possible to collect complete particulars of the 126 farms in the time available. Only in 81 cases was it possible to interview both the farm owner and the share-milker on the same farm. The balance of the 126 farms was made up of 30 farm owners and 15 share-milkers. This in itself does not directly affect the results because the comparisons are not made between owner and share-milker but between different groups of owners or between different groups of share-milkers. The only effect it has is through a reduction in the possibility of checking the figures for production, cow numbers, acreages etc.

It has been mentioned previously that the survey as planned was not adhered to. Owing to the fact that quarter-share farms, were, with four exceptions, impossible to locate in the time available, a new classification was adopted. This was the substitution of dried milk supplying farms for the quarter-share farms. The survey was therefore done on three types of supply and two types of contract. The finally collected sample was somewhat different again from this. There were more than 20 items collected for each of the butter classes and fewer than 20 for each of the dried milk classes. In addition, details of four quarter-share farms were collected and these serve as a useful comparison in the following sections.

As the survey was carried out over the summer 1946/47, it was not possible to collect figures relating to the then current season. The practice adopted, therefore, was that of collecting the production figures for the dairy season June to May 1945/46; the income and expenses figures for the taxation year April to March 1945/46; the investment figures and the herd size figures were collected for the position as at mid-January 1946.



These figures have been collected for two different periods because neither the farmers nor the share-milkers kept any figures for any period other than the taxation year. As a result of this, the butterfat production figures do not bear an exact relationship to those of the income, and any comparison of the

two (Section V) should therefore be interpreted with this fact in mind. This three months intervals between the two periods does not invalidate, however, all comparisons made between the two sets of figures. The relative scales of production of the farms as a measure of their relative size will not, it is reasonable to suppose, be altered by that interval which falls towards the end of the season. The drought in the Autumn of 1946 affected the results of the production and income analyses in a differential manner. It is suggested, however, that any inaccuracies from this source are smaller than those that would have resulted had the information been collected for the preceeding twelve-monthly periods.

The system adopted for the actual survey was to divide the farms roughly into locality groups and make each visit from some "base" centrally situated in the area. The advantage of such a method is that it is in itself an introduction to the co-operators in that district. Its effect upon the facility with which data can be collected can be judged from the fact that of the eight refusals met with, six were in a district in which this system was not adopted.

(c) Analysis of Data.

For the purpose of analysis all farms have been taken as single units. Where the figures supplied were for those where the farm owner employed more than one share-milker, the owners' and the farms' figures have been adjusted to take account of this; e.g. size of farm .... if data provided was that representing two farms, the total area of all farms would be divided by an additional unit to get the class average. Where certain information on a schedule was either unreliable or not collected, only the individual data in question was omitted from this analysis. The balance of the data on the schedule was used for analysis where required. In this way the maximum use could be made of the information gathered. Had the survey been more extensive, the correct procedure would have been to reject the whole schedule and work from completed schedules alone. As a consequence of the policy adopted, however, it will be noted that only the totals relating to the same set of figures will correspond but they will be often different from the grand totals of 126 farms, 110 farm owners and 93 share-milkers.

The gross income of the farm owner was determined either by totalling his share of the receipts, including those from sales of cull stock and adding on the value of any farm produce used or, by deducting the payments made to the

share-milker from the total gross farm income. The share-milkers gross income was determined by totalling his share of the receipts, including sales of cull stock, and adding the sum of £75 for the value of house and perquisites. Though the actual analysis used £75 for the value of housing purposes, a truer figure would have been somewhat higher than this as in nearly every instance the standard of housing compared very favourably with 'the average suburban dwelling'. There were two or three notable exceptions to this, however, but where the standard of housing was lower than the standard taken, the disparity has been ignored. The same applies to the cases where the standard of housing was higher than the average.

The net income of the farm owner was arrived at by deduction of paid out costs plus depreciation and mortgage or overdraft interest from his gross income. From this figure, which approximates the taxable income, interest on equity capital (Section V) calculated at 5%, and wages of his own labour were deducted. The last figure being derived by varying the adult male wage (5 guineas per week for that year) according to the time worked per week. The balance left represents a combination of management reward and pure profit. It is this figure which is used (Section 5) as a means of comparing the incomes of the different groups of farm owners. The net income of the share-milker was found by deducting his paid out costs, depreciation, mortgage or overdraft interest and a calculated wage for family labour from his gross income. Next was deducted interest on equity capital, if any, and a personal labour reward of £273. The balance left, as in the case of the farm owner, represents a combination of management reward and pure profit. It is this figure that is used as a means of comparing the different groups of share-milkers. In the determination of the figure representing the management reward and pure profit (hereafter called the management-reward) the only tax deducted as a farm expense was land tax. No account was taken either of Social Security or Income Tax as these were regarded as being a distribution of the income once earned and not connected with farm costs. The disadvantage of comparing the position of half-share, third-share and quarter-share farm owners on the basis of their management-reward is that in each group the degree of management exercised is quite different. (See App.IV) The advantage is that there is a minimum of arbitrary assumption involved. In the following relevant sections the assumptions and definitions not covered, or only covered in a general way in this section, will be dealt with in detail.

PART II.

RESULTS

PART II

SECTION III

GENERAL NATURE OF FARMS ON WHICH SHARE-MILKING CARRIED OUT

SIZE OF FARMS

For the purpose of group comparison the area devoted to dairying (effective area) on the farms has been calculated as the total area minus that occupied by house and buildings, minus any non-usable waste and minus any area given over to other types of production. It does include, however, the area given over to drains, hedges and shelter belts. Doig (3) calculated the effective area of the farms he surveyed as approximately 81% of the total area. This figure is, by inspection, too low for the farms covered by the present survey. The comparable figure would in this case be approximately 95% to 97%. It should be noted, however, that there is a slight difference in the definition of the effective area; Doig includes the area occupied by house and buildings. Altering either definition to comply with the other is not likely, however, to make a difference of more than one percent in either calculated effective area.

Table 2, showing the average effective areas of the three classes of farms under survey, illustrates that share-milking is carried out on considerably larger than average farms (Section VI).

Table 2. Average effective area in acres of the farms surveyed.

Contract	Total Area	No. of farms	Av. effective area
1/4 share	756	4	189.0
1/3 share	8,961	59	151.9
1/2 share	7,478	62 *	120.6
All farms	17,195	125	137.6

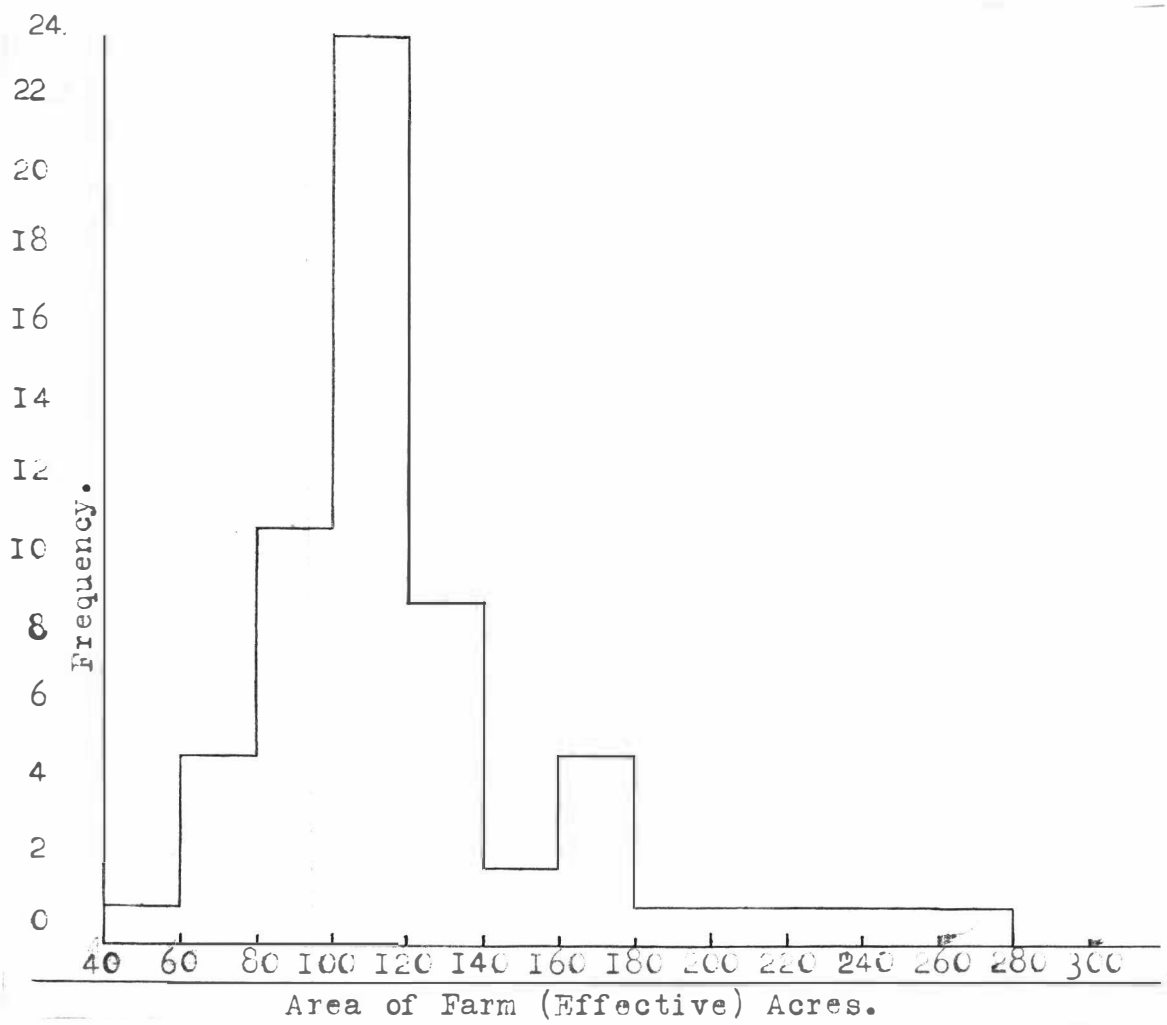
* Omits one farm where data on area not reliable.

The table also shows the increase in area accompanying any reduction in the share-milker's share of the farm proceeds.

The standard deviations of the 1/3 share and 1/2 share groups, as calculated from the formula .. $s = \sqrt{\frac{Sx^2}{n-1}}$, are 58.8 ± 5.4 and $41.2 \pm .37$ respectively.

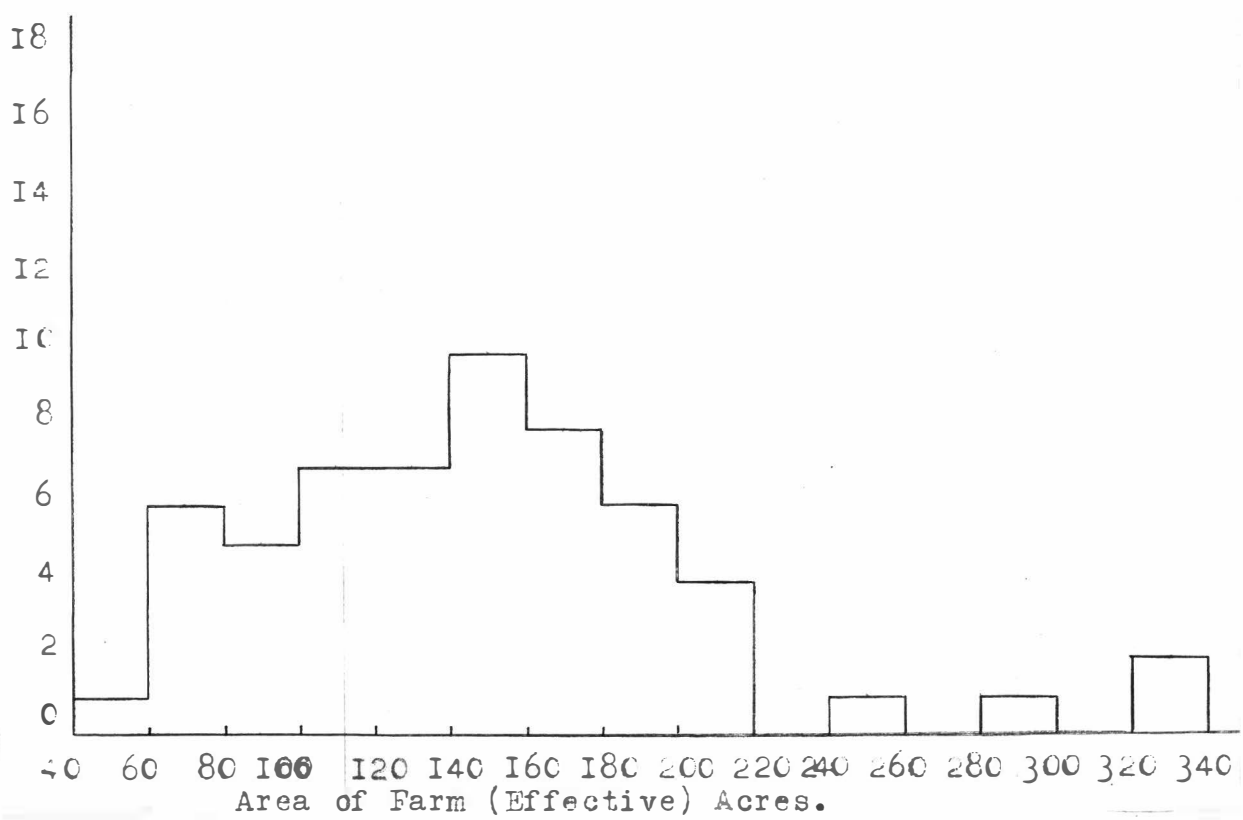
Graph No Ia

Frequency distribution of Farm size
(Half share farms)



Graph No Ib

Frequency distribution of Farm size '
(Third share farms)

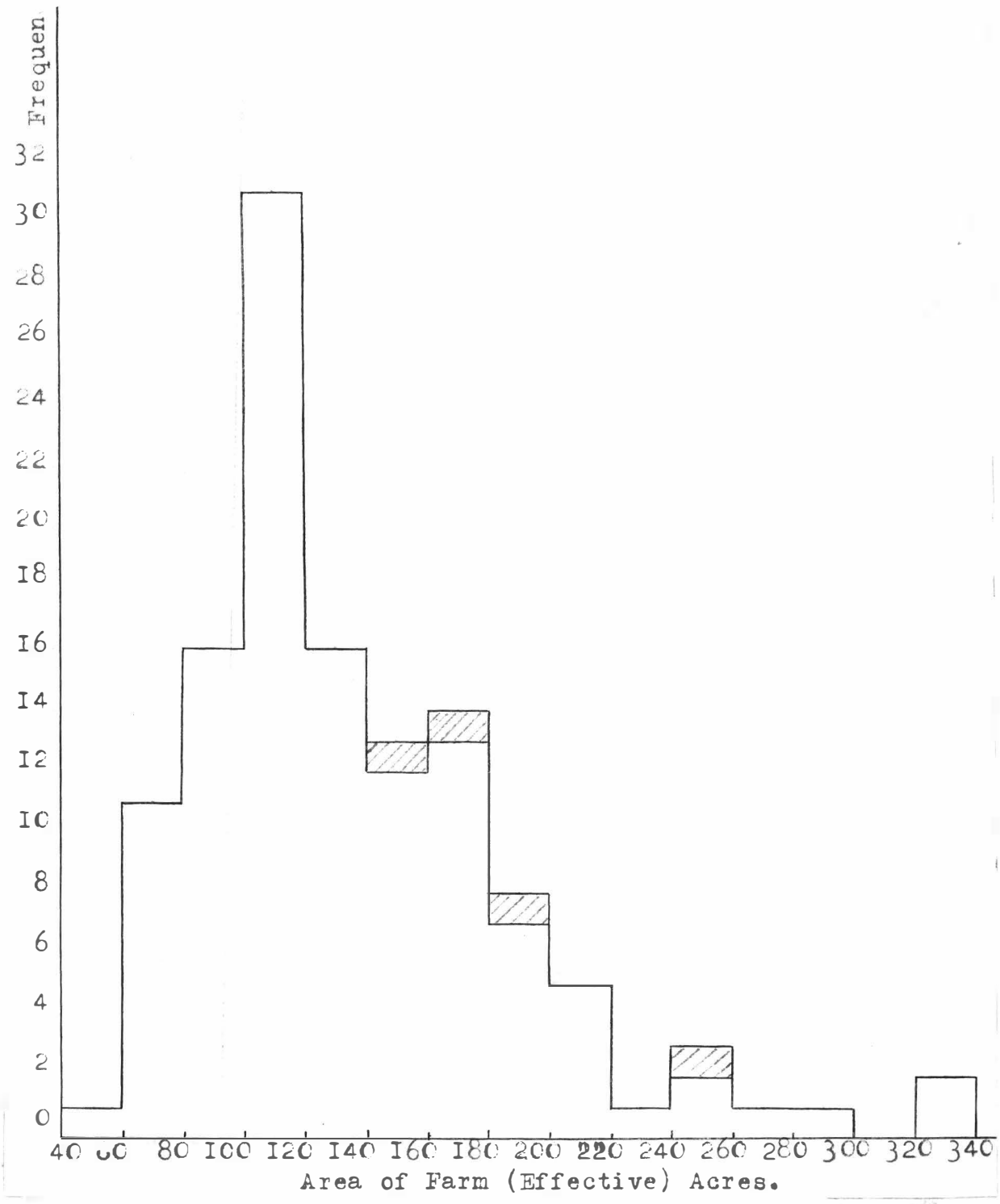


' Omits one at 360 - 380 acres.

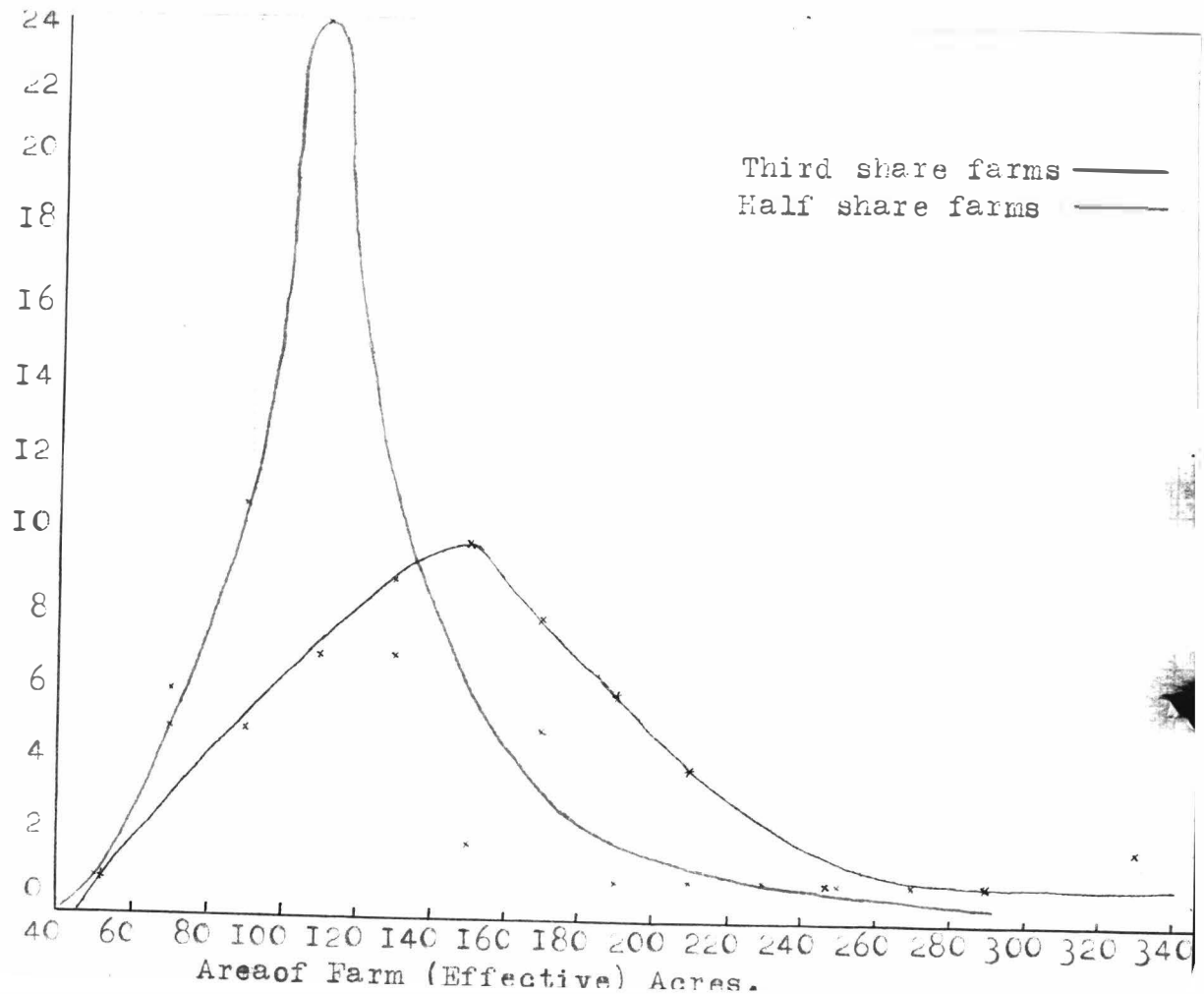
Graph No 2

Frequency distribution of Farm size
(All farms)

Quarter share farms thus:.....



' Omits one at 360 - 380 acres.



These figures indicate that, (a) Both types of contract are found over a wide range of farm size. (b) The variation in area is greater for the 1/3 share farms than it is for 1/2 share farms. As shown by the formula $s/\bar{x} = \frac{s}{\bar{x}} 100$, the Coefficients of Variation of the two groups are 38.7% and 34.2% respectively. That is there is a greater absolute variation in the third share group about the third share mean than there is in the half share group about the half share mean. The implications of these figures are therefore that while share-milking is in the main carried out on somewhat larger than average farms, both the principal contracts are found in operation on quite small farms as well as on very large ones.

Graphs 1. and 2. show the frequency distribution of the various sizes of farms in class intervals of 40 - 59, 60 - 79 acres etc. From these graphs it is observed:-

(a) That there are more farms below the average size than above it.

(b) That with the exception of the 1/3 share farms the modal farm is smaller than the average farm; i.e. in the 1/2 share farm group and the 'all farm' group there is a degree of skewness in the sample.

(c) That if it was not for the isolated very large farm the 1/2 share average and modal farms would tend to fall in the same class interval, but that the modal 1/3 share farm would tend to fall in a higher class interval than the average 1/3 share farm.

(d) That, as would be expected, all the 1/4 share farms fall in higher class intervals than do either the average or modal farms in the 'all farm' group.

While Table 2 shows the means of the 1/3 share and the 1/2 share farm group to be quite widely separated, graphs 1. and 2. indicate that there is a considerable degree of overlap in farm size in the two groups. A 't' test (7) applied to the two means, indicates however, that the two samples are drawn from different populations. Significance is at the one percent level when the following analysis is made.

$$t = \frac{d}{s\sqrt{n}} \quad \text{(see App. V for example)}$$

$$= \frac{151.9 - 120.6}{\sqrt{\frac{200679 + 104000}{58 + 61}}\sqrt{\frac{1}{59} + \frac{1}{62}}}$$

$$= 3.4 \qquad \text{H.S.}$$

(The 1% level of "t" for n = 121 is 2.626)

SIZE OF HERD

The average size of herd in each of the different groups, as shown by Table 3, has been calculated from the effective number of cows in milk for that season. In order to arrive at this latter figure the cows in milk on the night of January 15th 1946 on each farm have been multiplied by 1.055 (16). The results shown, therefore, refer not to the cows in milk at any one period but to complete lactation equivalents.

The collection of information twelve and thirteen months after the time to which it applies, involves the risk of error in that information. It is suggested, however, that as the information relating to the particular herd size had also been collected by the various dairy companies for the Dairy Board, the particular figures sought would be more clearly in the mind of the co-operator than a figure relating to any other period. For this reason the possible error will have been considerably reduced. It is further maintained that, as the herd sizes are nearly all fairly large, any absolute error will be but a small percentage error.

Table 3. Average effective size of herd.

Contract	Total Cows	No. of Herds	Av. Effective Herd Size
1/4 share	464.2	4	116.1
1/3 share	5,719.9	59	96.9
1/2 share	5,164.0	63	82.0
All farms	11,348.1	126	90.0

The above table illustrates that for each increase in the share-milker's share of the farm proceeds, the size of the herd decreases considerably. A 't' test applied to the means of the 1/3 share and the 1/2 share farm groups indicated that the two means were significantly different.

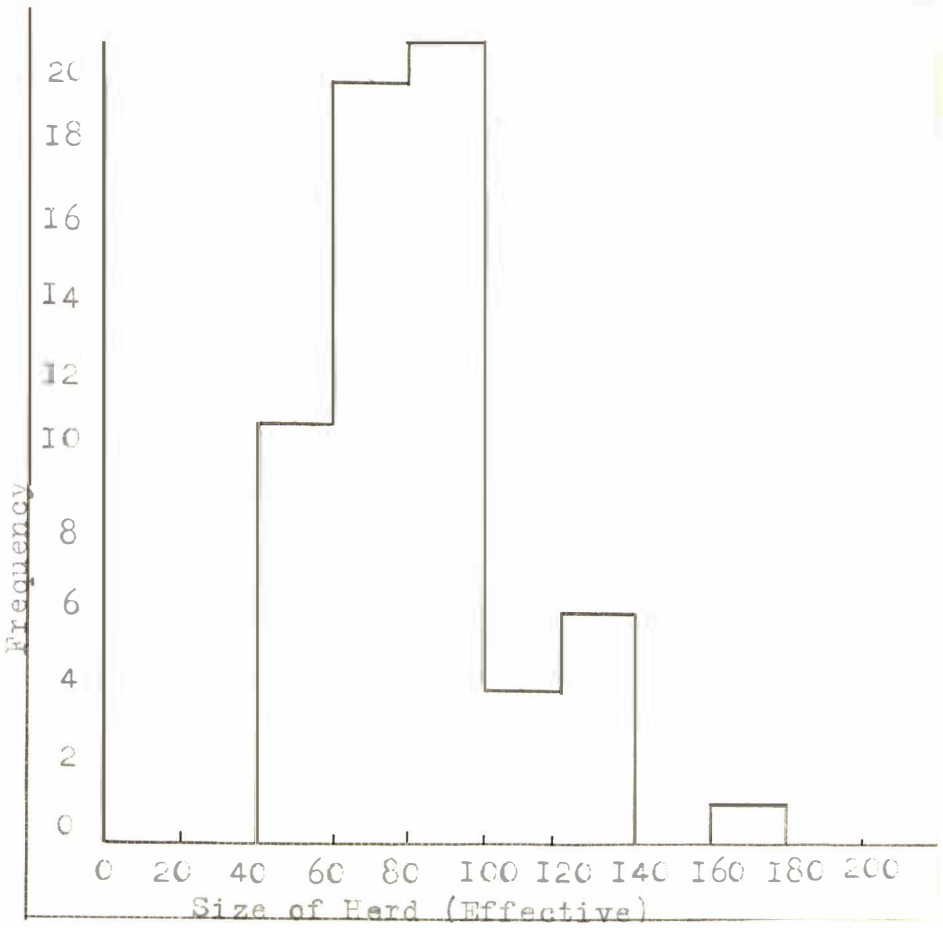
$$t = \frac{96.9 - 80.0}{\sqrt{\frac{50529.92 + 39553.38}{58 + 62}} \sqrt{\frac{1}{59} + \frac{1}{63}}}$$

$$= 4.6 \quad \text{H.S.}$$

(The 1% level of 't' for n = 122 is 2.626)

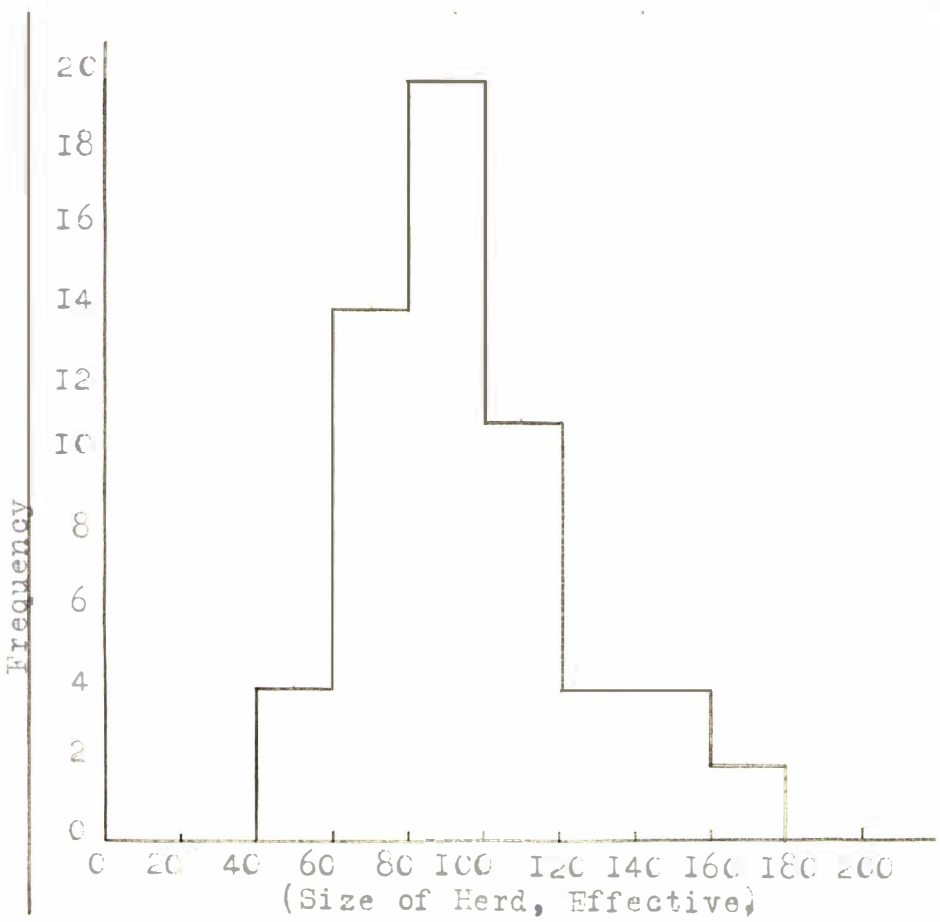
Graph No 3a

Frequency distribution of Herd size.
(Half share farms)



Graph No 3b

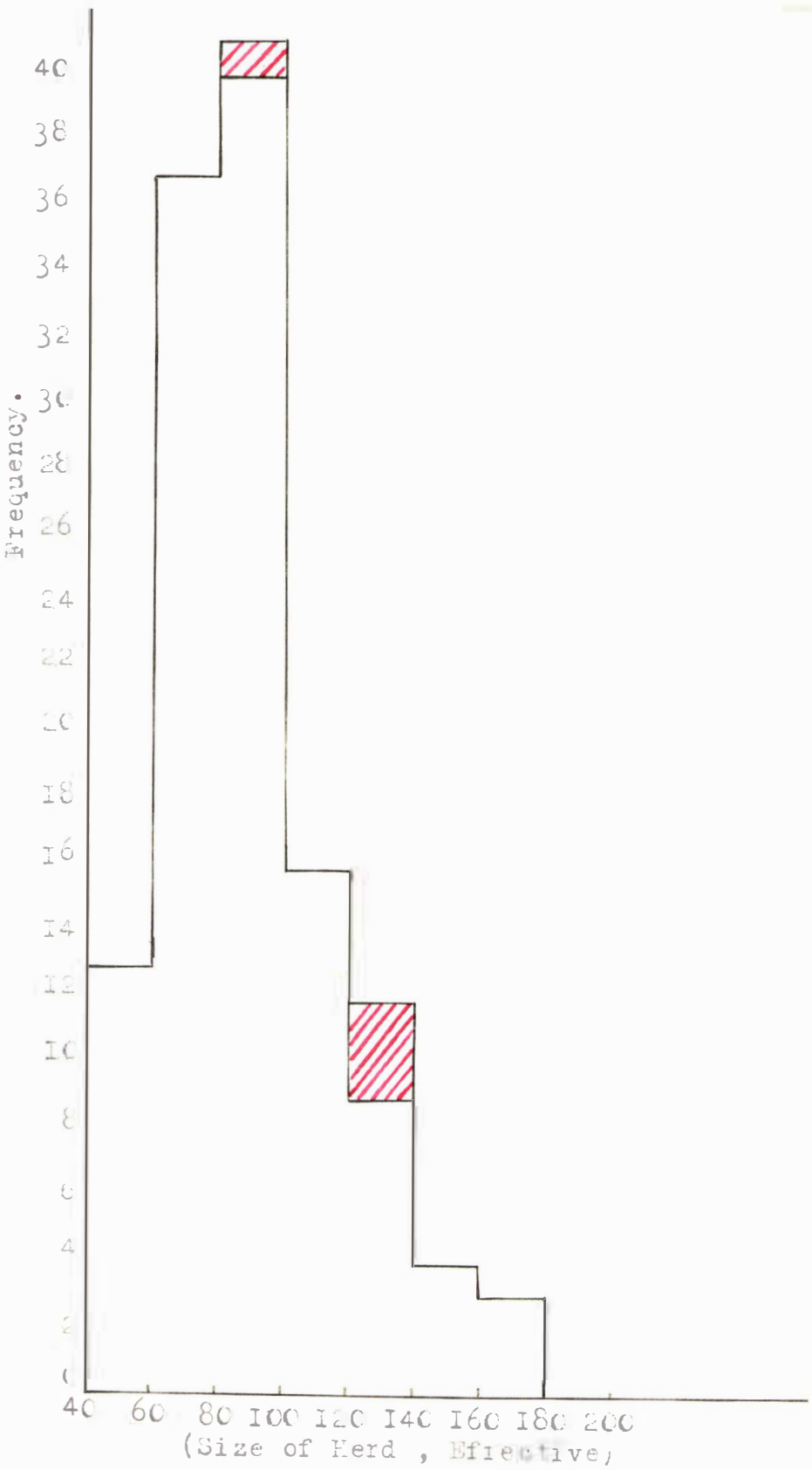
Frequency distribution of Herd size.
(Third share farms)



Graph No 4

Frequency distribution of Herd size.
(All farms)

Quarter share farms thus.////.



A comparison of Tables 2 and 3 indicates that as the size of farm and herd increase, the average carrying capacity decreases.

Table 4. Relationship of Contract to Carrying Capacity *

Contract	Cows carried per 100 acres
1/4 share	61
1/3 share	64
1/2 share	68

* Carrying capacity is the average cows carried per acre in each of the contract groups. In this instance it is an average of an average and not a true mean.

The standard deviations 29.5 ± 2.7 and 25.2 ± 2.2 about the 1/3 share and 1/2 share farm group means respectively, show that the range of herd size is quite considerable. Any differences in the distribution of the herd sizes about the mean, as implied by the differences in the standard deviations, are, however, due to the significant differences in the means. The Coefficient of Variation for each of the two groups is the same. viz. 1/3 share farms $s/\bar{x}$ = 30.44%

1/2 share farms $s/\bar{x}$ = 30.73%

It will be noted that the Coefficient of Variation of each of these groups is smaller than the corresponding figures for variations in farm size. Graphs .3.. and .4.. show the frequency distributions of the various herd sizes in 20 cow class intervals, the actual limits of which are 39.95 to 59.94, 59.95 to 79.94 etc. These graphs bear out the above statements and, furthermore, illustrate that:-

(a) The modal 1/3 share farm herd is smaller than the average herd size of that group.

(b) The modal 1/2 share herd is similar in size to the average 1/2 share herd.

(c) Any skewness in the two samples is due to the presence of a few very large herds.

(d) In the 'all farm' group the average herd size falls within the modal class for that group.

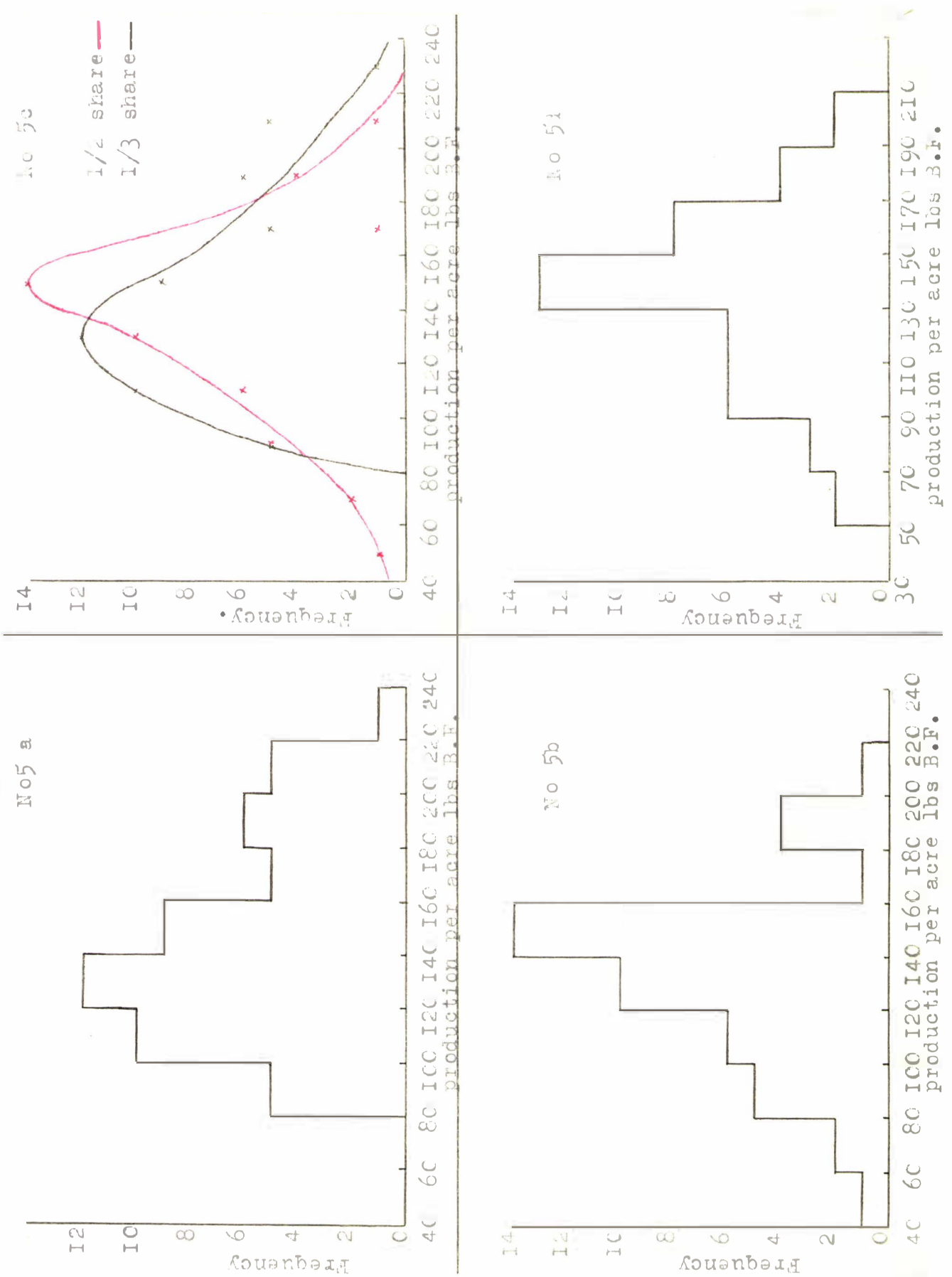
(e) Each of the 1/4 share herds is as large or larger than either the mean or modal herd in the 'all farm' group.

Graph No 5

Frequency distribution of production per Acre

Third share, 5a.

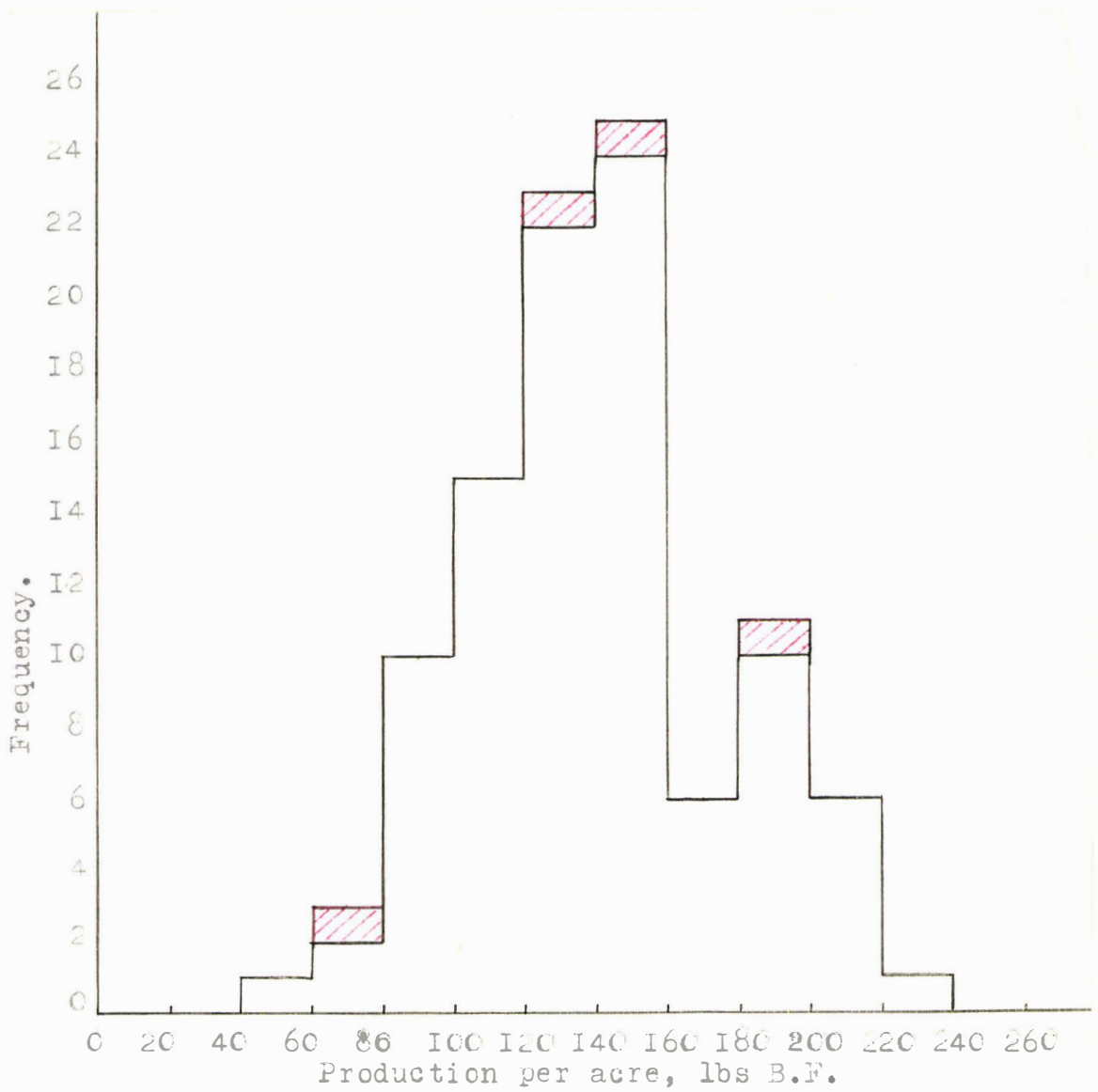
Half share , 5b, 5d.

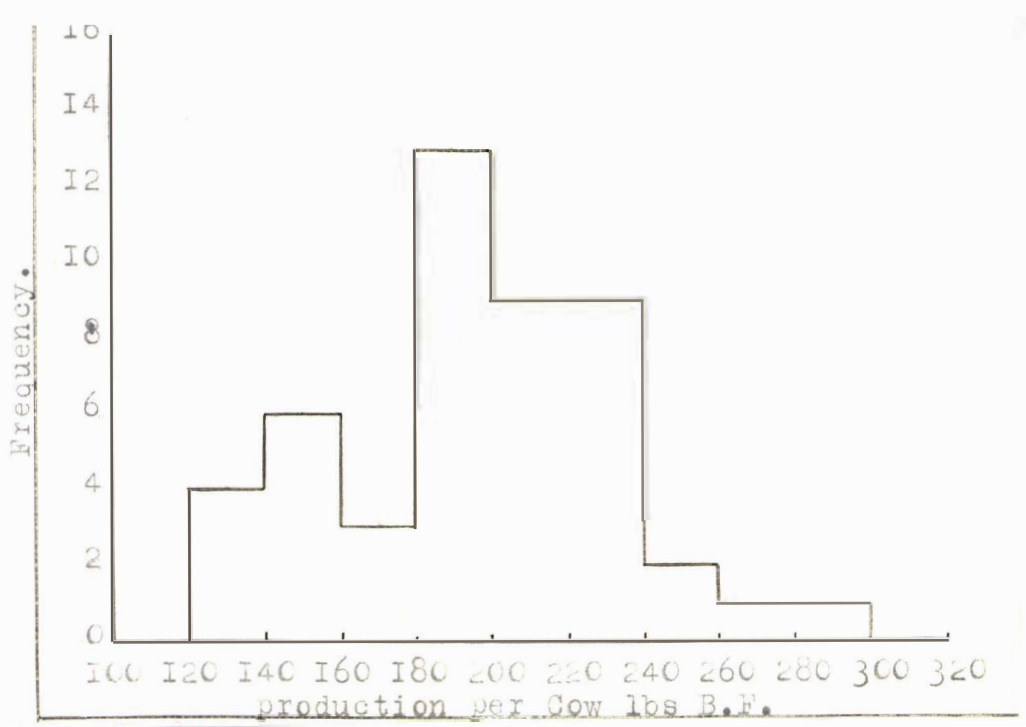


Graph No 6

Frequency distribution of production per Acre.
(All farms)

Quarter share farms thus.////..





AVERAGE BUTTERFAT PRODUCTION PER ACRE

A 't' test shows that the average butterfat production per acre of effective dairying land, Table 5, is non-significantly different in each of the two main groups.

$$t = \frac{134.9 - 125.4}{\sqrt{\frac{79,546.19 + 64,775.29}{51 + 44}} \quad \sqrt{\frac{1}{52} + \frac{1}{45}}}$$

$$= 1.2 \text{ N.S. (The 5\% level of 't' is } 1.984)$$

From this analysis has been omitted the four 1/2 share farms and two 1/3 share farms on which no replacements were reared. The inclusion of these data would tend to bring the means even closer together.

Table 5. Average Effective Butterfat Production per Acre.

Contract	Total B.F.	No. of Acres	Av. B.F. per acre	n
1/4 share	98,134	746	131.5	4
1/3 "	1,093,635	8,109	134.9	53
1/2 "	671,062	5,352	125.4	45
All farms	1,862,831	14,217	131.2	102

The standard deviations about the means of the 1/3 share and 1/2 share groups, 39.3 ± 3.8 and 38.3 ± 4.1 respectively, indicate a wide range of variation. The coefficients of variation of the two groups, however, show that in proportion to the size of their means 1/3 share farms vary to a lesser degree than do half share farms in production per acre.

$s/\bar{x}$ = 29.13% and 30.53% (1/3 and 1/2 shares respectively)

Graphs 5.6. show this difference in the variations but also illustrates that if it was not for the case of the one very low producing half share farm, this difference would be considerably less. Graphs 5.6 are drawn in class intervals, the actual limits of which are 39.95 to 59.94, 59.95 to 79.94 etc., so that a comparison of the three may be more readily made. Graph 5A. is drawn with similarly sized class intervals but with a different lower class limit. It will be observed that when this practice is adopted the graph takes on a much more 'normal' appearance. The cause of this is the concentration of farms in the 150 to 159 lbs. of B.F. group. This makes the data very sensitive to any change in the lower class limit. These graphs further illustrate that the per acre production from the average half-share is lower than that from the modal 1/2 share farm, but that the average 1/3 share farm falls in the modal class for that group. In the 'all farm' group

the lower average production per farm is the result of one very low producing 1/3 share farm, an explanation that is applicable to the 1/2 share group also.

Hamilton (4) using figures compiled by the Government Statistician (2) concludes that 'the increased efficiency of labour in the larger herds is associated with higher average production per cow and increased carrying capacity reflected in higher per acre production'. The deviation of the results of the present survey from these conclusions is possibly explanable in the following way. As the 1/3 share farm group (the farms of which are larger than the 1/2 share farms) tends to have a slightly lower carrying capacity (Table 4) than the half-share farm group, any higher average production per cow (Table 6) is not significantly reflected in higher per acre production. The lower carrying capacity apparently nullifies the higher production per cow. An alternative explanation is that as the 1/2 share group and the 1/3 share group are each comparatively small, the variation within each group is sufficient to reduce any between group variation to a level of non-significance.

AVERAGE BUTTERFAT PRODUCTION PER COW.

The average effective production per cow for the different contract groups has been determined by dividing the season's factory supply by the effective number of cows. The result of this analysis as indicated by Table 6, is to show that the average production per cow on 1/3 share farms is considerably higher than the average production per cow on 1/2 share farms. A 't' test of the means of the two groups indicates that these two means are significantly different. Significance is at the 1% level.

$$t = \frac{215.1 - 194.8}{\sqrt{\frac{87274.1 + 50440.29}{53 + 48}} \sqrt{\frac{1}{54} + \frac{1}{49}}}$$

$$= 2.8 \quad \text{H.S.}$$

(The 1% level of 't' for n = 107 is 2·626)

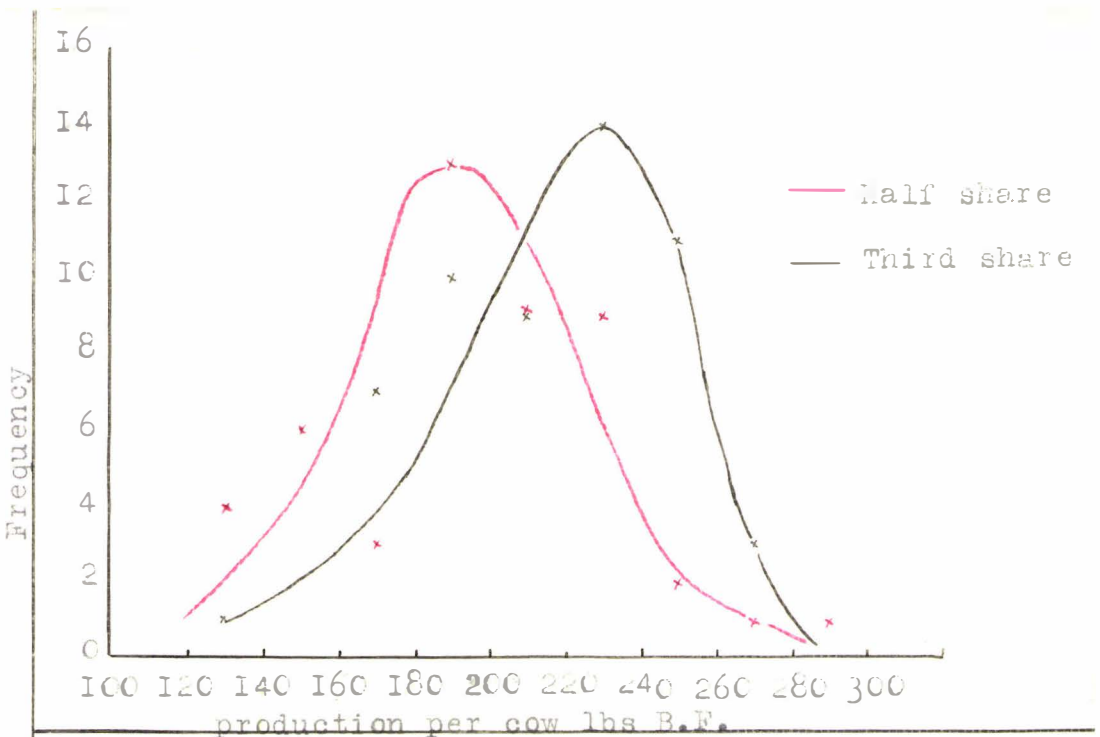
Table 6. Average Effective Butterfat Production per Cow.

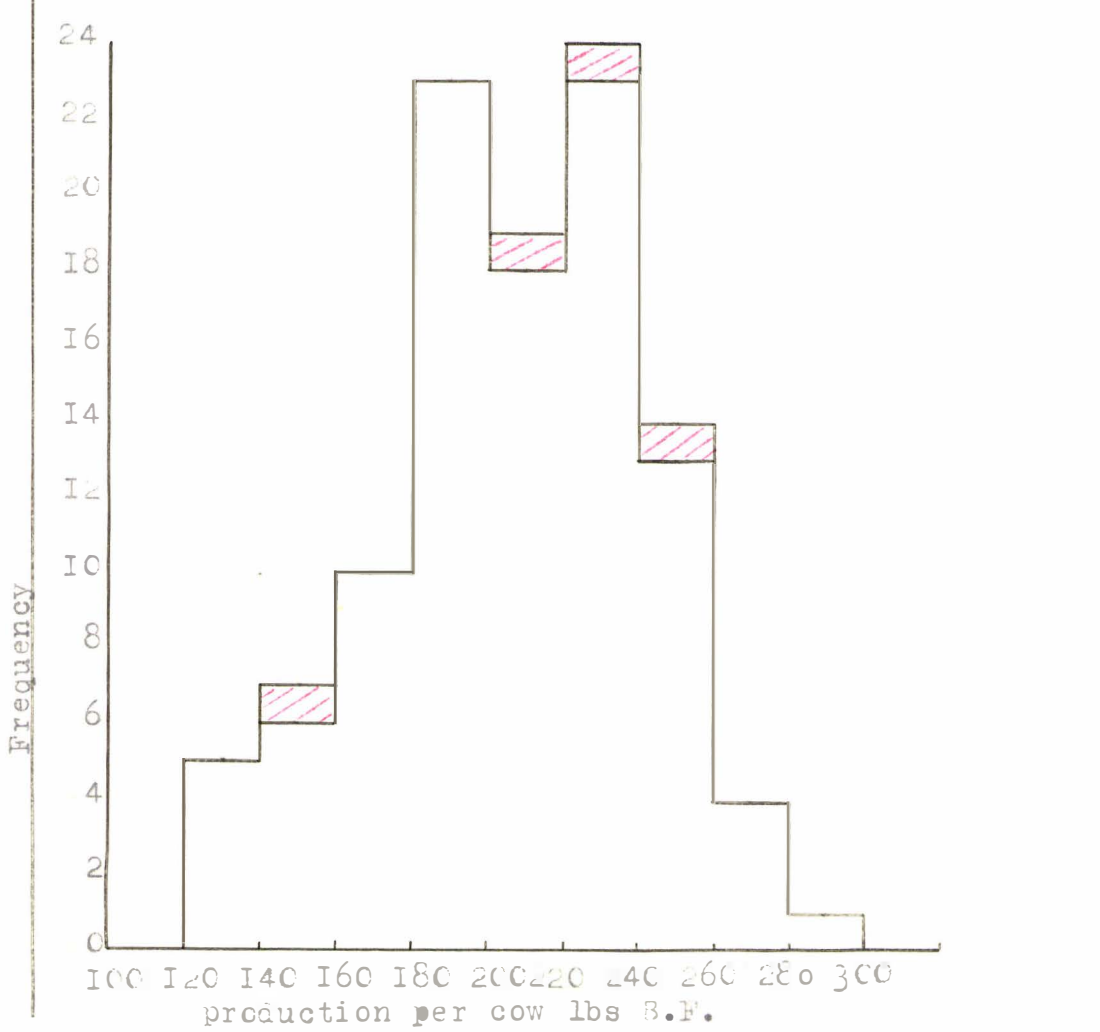
Contract	Total B.F.	No. of Cows	Av. B.F. per Cow	n
1/4 share	98,134	464.2	211.4	4
1/3 share	1,115,075	5,351.7	215.1	55
1/2 share	771,823	3,961.2	194.8	49
All farms	2,021,032	9,777.1	206.7	108

Graph No 8

Frequency distribution of production per Cow.
(All farms)

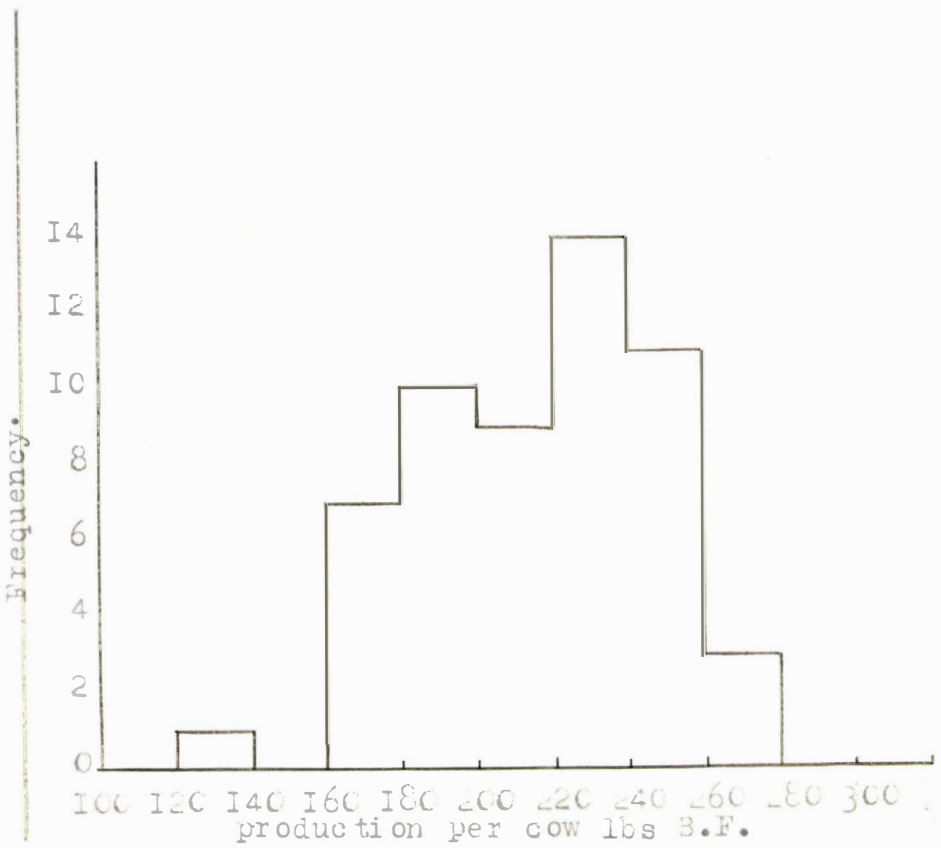
Quarter share farms thus ////.





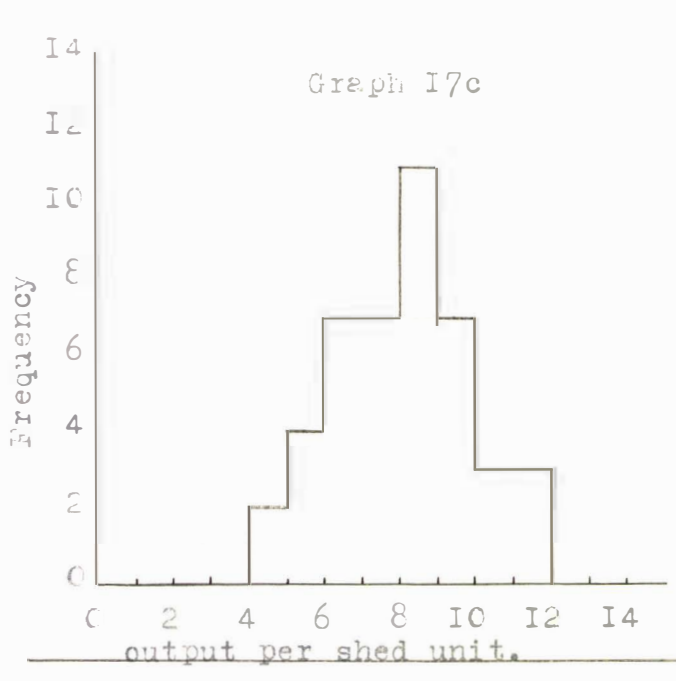
Graph No 7a

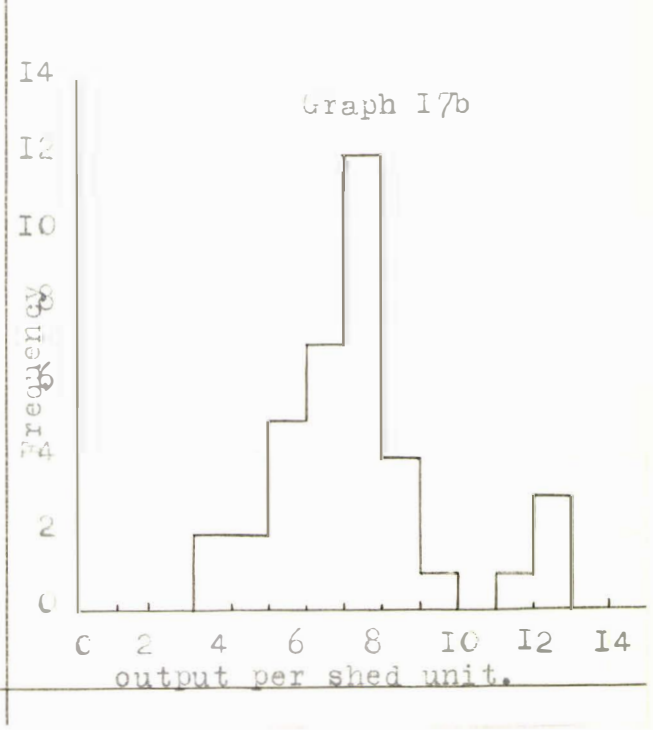
Frequency distribution of production per Cow.
(Half share farms)



Graph No 7b

Frequency distribution of production per Cow.
(Third share farms)





The disparity between the number of items in this table and the number in Table 5 is due to the inclusion in this table of the six farms on which no young stock was reared. The standard deviations of the 1/3 and 1/2 share groups are 30.8 ± 2.9 and 42.6 ± 4.4 respectively. The coefficients of variation indicate that relative to the size of the means, there is considerably more variation in per cow production within the 1/2 share group than within the 1/3 share group.

1/3 share group $s/\bar{x} = 14.27\%$

1/2 " " $s/\bar{x} = 21.87\%$

Graphs 7&8.. which are drawn in 20 lb. class intervals, the actual upper and lower limits of which are 99.95 and 119.94, 119.95 and 139.94 etc., show the concentration of the 1/3 share group about its mean and also demonstrate that even the removal of the one low producing herd from the half share group would not cause this group to be as concentrated as the 1/3 share group.

Hamilton (4) gives as a possible explanation of the higher per cow production of the larger herds, the view that it 'may be due, in part, to the fact that the larger herds tend to be concentrated in the better dairying areas, while many small herds are in non dairying areas'. The difficulty in applying such an explanation to the differences found between the 1/3 and 1/2 share farm groups lies in that both the samples in this survey were drawn from the same area. Furthermore it is a commonly held view that if a farm is not very highly developed it is likely to be held on 1/3 share rather than on 1/2 share. Admittedly, such a generalization would be difficult to justify by objective measurement but, if carrying capacity is accepted as a measure of the state of development, Table 4 would bear out this statement. Two explanations of the problem do, however, appear as likely alternatives. The first is that the number of cows actually carried per acre is not a true measure of the optimum carrying capacity of the farms. If this was so the implication would be that, as the 1/2 share farms were more heavily stocked per 100 acres than the 1/3 share farms there was either over stocking on the 1/2 share farms or under stocking on the 1/3 share farms. Either situation would have been advantageous to the 1/3 share herds because these herds would have been more adequately fed than the herds on the more heavily stocked on the 1/2 share farms. The other explanation is that the higher production per cow is the result of extra management exercised on the farm where the herd is owned by the farm owner. Of the two alternatives it is suggested that the former is the more likely, though sight should not be lost of the fact that the two farm groups are separated not only by the size of the herds,

but also by the type of contract. It is possible therefore, that the lower production per cow on the half-share farms is the immediate result of the higher rate of stocking on these farms. The higher rate of stocking in turn, was possibly due to pressure by either the farm owner or the sharemilker, or both, as they attempted to get the largest possible return from farms, that in many cases are too small to give a going rate of return to all the factors of production. (Section V). It should be borne in mind, however, that 1945/46 was a drought year and that in a normal season this increased stocking may not have resulted in a lower per cow production.

TOTAL OUTPUT OF BUTTERFAT PER FARM

The figures for the total butterfat production per farm (Table 7) are the total factory supplies for the dairy season 1945/46. The period covered by these figures is either from the 1st June to the 31st May or the 1st July to the 30th June, depending upon the factory practice in the district. In most instances the figures are for the former period. In all except a possible nine or ten cases the figures are those shown on the farm owner's or the share-milker's dairy statement. In the cases where this does not apply, the production levels were estimated by either the owner or the share-milker, or both.

Table 7. Average Factory supply of B.F. per farm, lbs.

Contract	Total B.F.	n	B.F. per farm
1/4 share	98,134	4	24,534
1/3 share	1,151,075	55	20,929
1/2 share	771,823	49	15,752
All farms	2,021,032	108 *	18,713

* This Table includes the six items where no young stock were reared on the property.

A 't' test applied to the 1/3 and 1/2 share group means indicated that they were significantly different. Significance was at the one percent level.

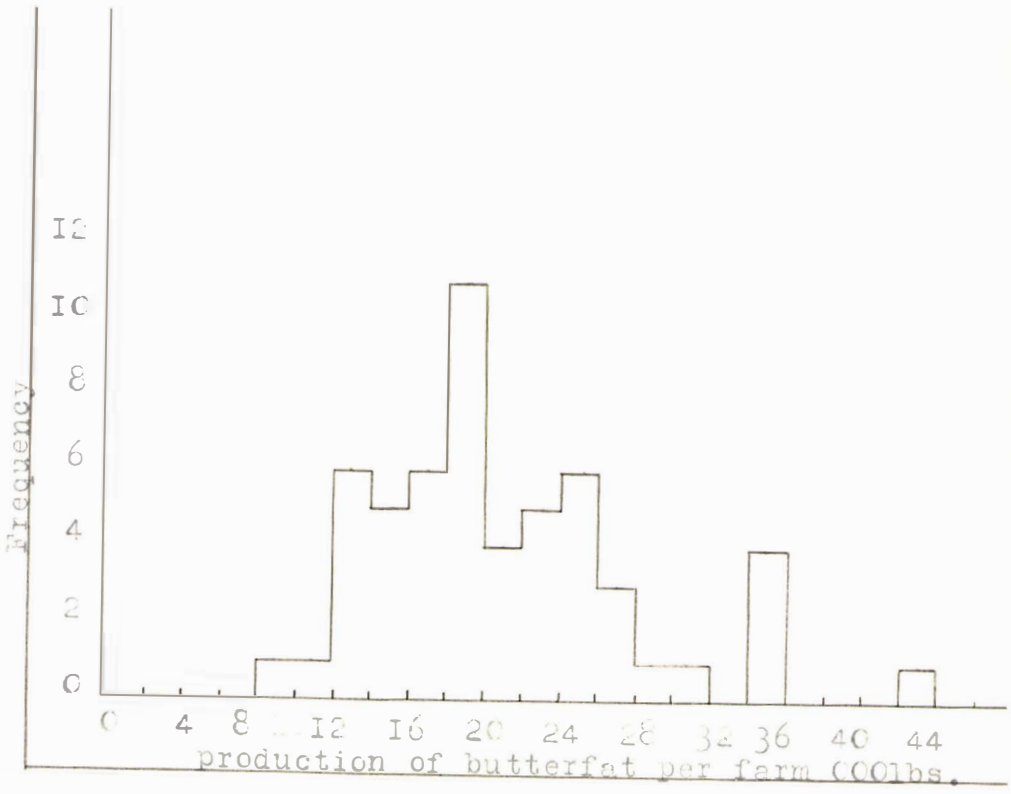
$$t = \frac{209.3 - 157.5}{\sqrt{\frac{176,953.0 + 238,067.76}{48 + 54}} \sqrt{\frac{1}{49} + \frac{1}{55}}}$$

$$= 4.18 \quad \text{H.S.}$$

(The 1% level of 't' for n = 104 is 2.626)

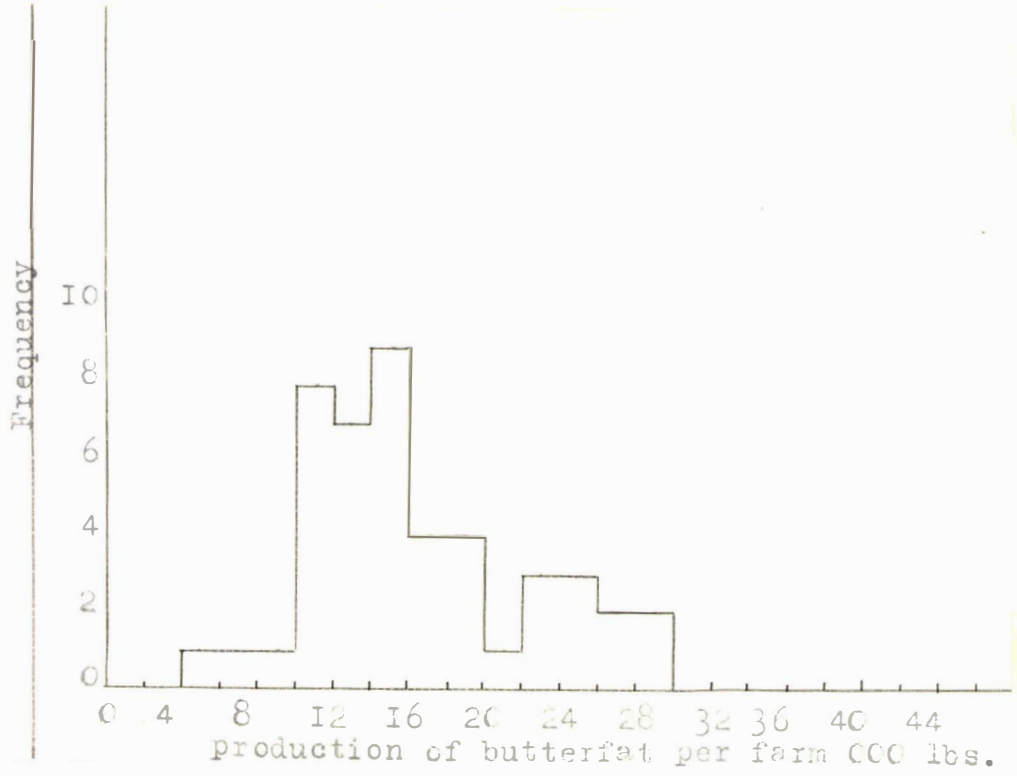
Graph No 9a

Frequency distribution of production per Farm.
(Third share farms)



Graph No 9b

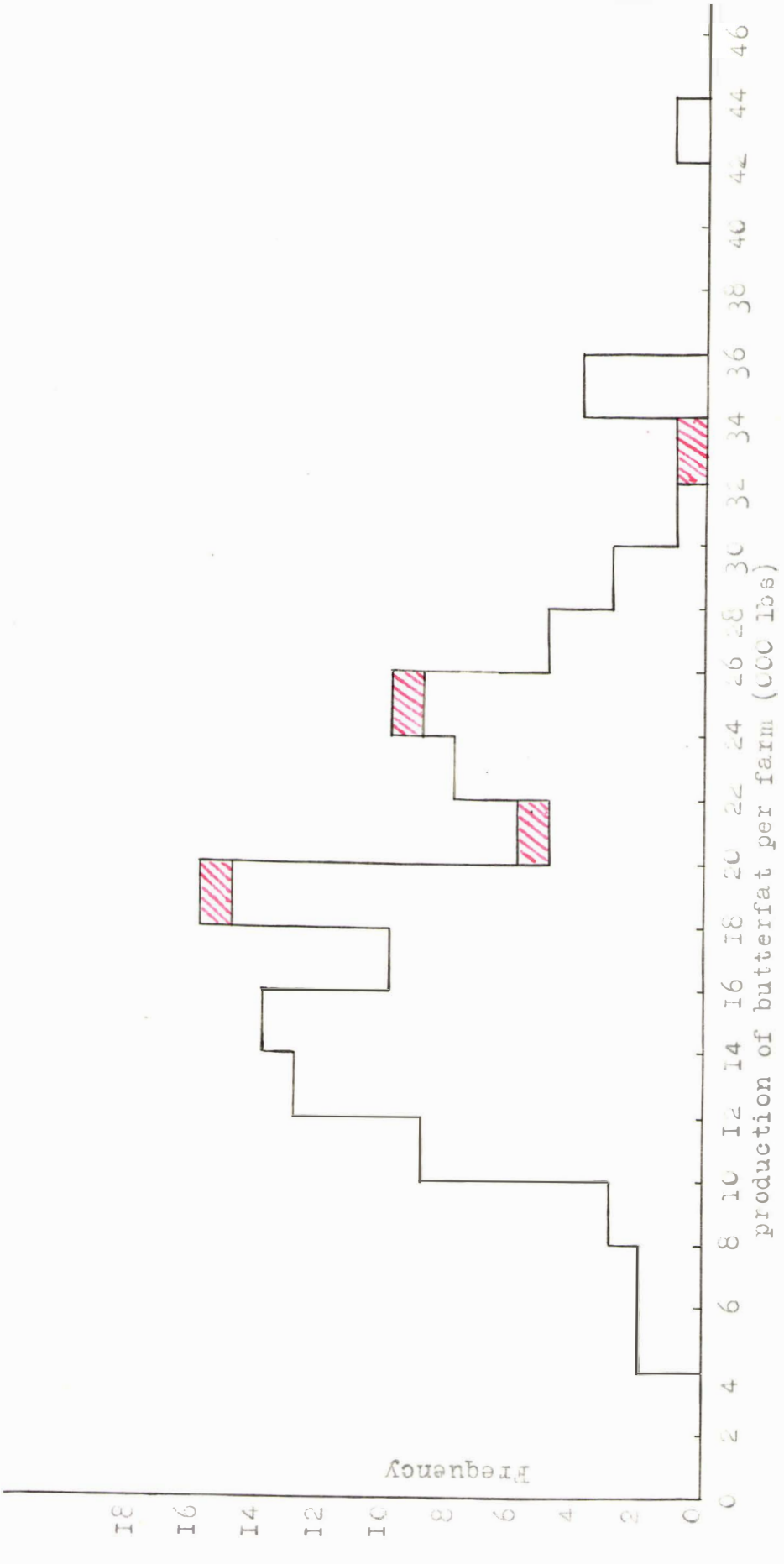
Frequency distribution of production per Farm
(Half share farms)



Graph No 10

Frequency distribution of production per Farm
(All farms)

Quarter share farms thus ////.



The coefficients of variation of the 1/3 and 1/2 share group indicate that there is, relative to the size of the means, more variation in total production in the 1/2 share group than in the 1/3 share group.

1/3 share group $s = 6630 \pm 645$, $s/\bar{x} = 31.29\%$

1/2 share group $s = 6070 \pm 673$, $s/\bar{x} = 38.53\%$

The extent of this variation is illustrated graphically by graphs 9a.&.9b They show that while there may be more relative variation within the half-share group this group is relatively free of skewness, but that the 1/3 share group has been skewed to some slight extent. The 'all farm' group is somewhat skew also.

The size of the farm business is probably best shown by the total B.F. production per farm, since it sums up the number of acres, the carrying capacity and the production per cow. Graph I.Q. illustrates that while the bulk of the herds produce between 10,000 and 30,000 lbs. B.F. there are some which produce either more or less than this amount. The problems associated with the division of the total returns do not tend to be acute, however, when the herd production is large, but they do become when the total production falls below a certain level (Section V). Therefore the total production figures, the type of contract and the value of the payout being known, do give quite a good rough and ready indication of just what constitutes the lower limits of the economic share-milking farm.

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CAPITAL INVESTMENT

Method of Determination.

The term 'Capital Investment', as used in this study, has not the same meaning as either of the terms 'productive value', or 'Government capital value'. It is an historical record of the money that has been invested in the farm since and including its purchase. It is an approximation of the amount of money that, up to the time of the survey, would have been available for alternative investment had it not been put into the farm. Capital investment was chosen in preference to 'present capital value' because the determination of the latter is in itself a question begging process. The present capital value is that value which will give, at the ruling rate of interest, a return just equal to the 'surplus' from which it was determined.

To the purchase price of the property was added the cost of extended buildings (other than the farm owner's house and garage), fences, shelter belts, drainage, water supply, plant and implements, roading and bridging, vehicles (other than cars), stock, pasture laid down for the first time, and the initial cost of clearing land. The cost of personal labour was calculated as accurately as possible and included where applicable. Improvements to the capital value of the pasture have been ignored throughout as the determination of a figure representative of this item, requires a much more intimate knowledge of the farm than it is possible to gain in a brief visit. Similarly, improvements made to existing capital assets have been omitted. They have been classified as maintenance of existing capital. In all cases (except with stock) the figures gathered were the actual cost at the time the improvement was made, and hence do not represent the present day replacement cost. In the case of stock investment the actual cost basis had to be abandoned because of the difficulty in calculating costs of herd expansion. The figures used in this case are the replacement cost values. They are £12 for milking cows, £9 for yearling heifers, £4 for calves £25 for horses and £4 for sows. No account has been taken of depreciation of the capital assets as it was contended, that for the purpose of this analysis any depreciation would have been balanced by the theoretical 'depreciation fund'. The assumption underlying this approach was that the depreciation fund was interest bearing at the same rate as the invested capital. The equity capital was therefore calculated as being the capital investment minus the capital indebtedness. The omission of any consideration of the amount of depreciation assumes that the depreciation fund has not been added to the original capital investment by re-investment in the farm. Depreciation money has however, in the majority of farms in New Zealand, been put back immediately into the farm either in the form of additional assets or mortgage repayment. If either of these practices has been adopted on the farms surveyed, and they most likely have been, the capital investment figures will be shown in the analysis as somewhat larger than they should be. As, however,

(a) the stock have been put in at a standard replacement value,

(b) the plant and implements have not been counted cumulatively,

(c) the only other depreciating item is buildings which have tended to depreciate little in money,

there will not be much disparity due to depreciation being omitted.

It is suggested that a capital figure determined from an historical record of investment somewhat understates the present day Waikato value of the farm and etc. by about £10 to £15 per cow. The advantages of the system adopted, however, are that it relates the capital invested to the date of purchase (see later) and it avoids use of methods that are even more arbitrary. The alternatives might be to -

(a) use 'present day values' which, as has been noted previously, would be an attempt to fix the values so that the average return would just equal the percentage regarded as appropriate.

(b) 'Correct' the capitalization per cow by a regression coefficient on to the present day payout.

(c) Give an artificial capitalisation per cow from the more up-to-date investments.

(a) Capital Investment in Relation to Type of Contract and Supply.

There were only eightyone cases in which it was possible to get information relating to the same farm from both the owner and the sharemilker. In 10 additional cases, however, 1/3 share owners provided data without the share-milker, for various reasons, doing so. In these cases an estimate has been made of the share-milker's capital investment so that these farms may be included in the capital investment and the capital indebtedness sections. No estimation of 1/2 sharemilker's capital investment has been made. In the case of the 1/3 share-milkers it was found (see App.V), that the mean and the modal investment were £0.4 per cow where the supply was to a butter factory. Where the supply was to a cheese factory the sharemilker's modal investment was £0.0 and an average of £0.32 per cow. In no case did a 1/3 sharemilker have either a business overdraft or a mortgage. For five butter supplying farms and five cheese supplying farms, therefore, the sharemilker's capital investment was estimated and included in the analysis. The rates of interpolation were £0.4 and £0.2 per cow for butter and cheese supplying farms respectively. It is probable that these figures are a little on the high side, but this will allow for any deviation from the modal figures.

Included in the capital investment and the capital indebtedness sections are five farms, where no young stock were reared for replacements that season. In order that the greater number of cows in milk on these farms ~~is~~ would not unduly lower the capital investment per cow figure, an estimate was made of the number of

cows that would have been in milk had young stock been reared on the farms. It is this reduced number of milking stock that was used as the basis for calculating investment per cow in the land and dead stock. For the determination of investment per cow in the live stock, the actual number of cows in milk was used. Failure to do this would have resulted in the investment per cow in the live stock being over-estimated by about a quarter. In all cases the term 'capital investment per cow' refers to capital investment per effective number of cows in milk.

Table 8 classifies the average capital investment per cow by type of contract and supply when the owner and the sharemilker both provided information relating to the same farm. Table 9 demonstrates the average capital investment per cow of all the farm owners and the average investment per cow of all the sharemilkers when they are classified by type of contract only.

Table 8. Average Capital Investment per Cow (£) on Farms where both parties supplied data.

Contract	Butter	n	Cheese	n	D.M.	n	All supplies	n
	£		£		£		£	
1/4 share	57.9	3	86.3	1	-	-	65.0	4
1/3 share*	78.8	26	90.8	20	79.0	9	83.1	55
1/2 share	85.7	19	92.4	6	93.6	7	88.8	32
All contracts	80.1	48	91.0	27	85.4	16	84.3	91

Table 9. Average Investment per Cow (£), all Owners and all Sharemilkers.

Contract	Owners	n	Sharemilkers	n
	£		£	
1/4 share	64.7	4	0.2	4
1/3 share	82.6	55	0.46	56*
1/2 share	71.0	49	16.7	43

* Includes ten farms where the sharemilker's investment has been estimated (see above).

The above tables indicate that both the type of supply and the type of contract affect the investment per cow. Table 9 illustrates the division of capital between the farm owner and the sharemilker under the three types of contract. The most important part of this table is the division under the system of half-share milking. In the case of the 1/4 and 1/3 sharemilkers the small investment is accounted for almost wholly by the ownership of half the pigs. The capital investment of the 1/2 share-milkers is made up of herd ownership and, in many cases,

though not in all, ownership of implements and pigs. The reduced capital investment per cow of the 1/2 share farm owners, as compared with the 1/3 share owners, is due to the ownership of the livestock by the latter class and the lack of stock investment by the former.

When the data summarised in Table 8 was subjected to investigation by the Analysis of Variance method (7) the differences between the means of the sub-classes were seen to be less significant than the table would indicate. (See App.V for working data). As there was no dataavailable for the 1/4 share D.M. sub-class, the method of analysis adopted was that of sub-classing in the following way.

(a) All contracts for cheese and butter supplies.

(b) All supplies for 1/3 and 1/2 share contracts.

By the former of the two methods the results obtained indicate that there is a definite variation in investment per cow as between cheese and butter supplying farms. The cheese farms have a significantly higher investment per cow than the butter farms. Significance is at the one percent level. The variation in investment per cow as between 1/4, 1/3 and 1/2 share farms, is, however, not so highly significant. Significance is only at the 20% level. (Probably 10% but tables not available for checking). The between groups variations are shown in Table 10 which follows.

Table 10. Capital Investment per Cow on 1/4, 1/3 and 1/2 share Farms supplying butter and cheese factories.

Source of Variation	d.f.	S.S.	M.S.	F.	Sign
Sub-classes	5	808.8			
Between contracts	2	311.1	155.6	2.15	N.S.*
Between Supplies	1	369.7	369.7	5.11	H.S.
Interaction	2	128.0	64.0	-	N.S.
Error	67	-	72.27		

* Significant at the 20% level and probably at the 10% level.

When the latter of the two methods was used the indication is that, as between all supplies, there is no significant difference. The difference between 1/2 and 1/3 share farms as regards contract differences is, however, maintained at the 20% level and probably so at the 10% level. 1/2 share farms are, by this analysis, shown to have a higher capitalisation per cow than 1/3 share farms for all types of supply.

Table 11. Analysis of Variance. Capital Investment per Cow on 1/2 and 1/3 share Farms supplying Butter, Cheese and Dried Milk Factories.

Source of Variation	d.f.	S.S.	M.S.	F.	Sign
Sub-classes	5	219.6			
Between contracts	1	88.9	88.9	3.30	N.S.*
Between supply	2	87.9	43.9	1.63	N.S.
Interaction	2	42.8	21.4	-	N.S.
Error	79	-	26.9		

* Non significant at the 5% level but significant at the 20% level and probably so at the 10% level.

When the data is further analysed under the sub-divisions of,

(a) All contracts

(b) All supplies,

irrespective of the other factor, the results indicate that there is a significant difference between contracts and a significant difference between supplies for investments per cow.

Table 12. Analysis of Variance. Capital Investment per Cow.
(Classification by type of supply).

Sources of Variation	d.f.	S.S.	M.S.	F.	Sign
Total	88*	27,647.8			
Between Group	2	2,009.3	1,004.6	3.4	S
Within Group	86	25,638.5	298.1		

Table 13. Analysis of Variance. Capital Investment per Cow.
(Classification by type of contract).

Sources of Variation	d.f.	S.S.	M.S.	F.	Sign
Total	88*	27,647.8			
Between Groups	2	2,180.7	1090.3	3.7	S
Within Groups	86	25,467.1	296.1		

* As in two cases, the data refers to two farms, N is reduced from 91 to 89 and the degree of freedom to 88.

Graph No II

Date of purchase of Half and Third share Farms
(Where both Owner and Share-milker
provided data for the farm)

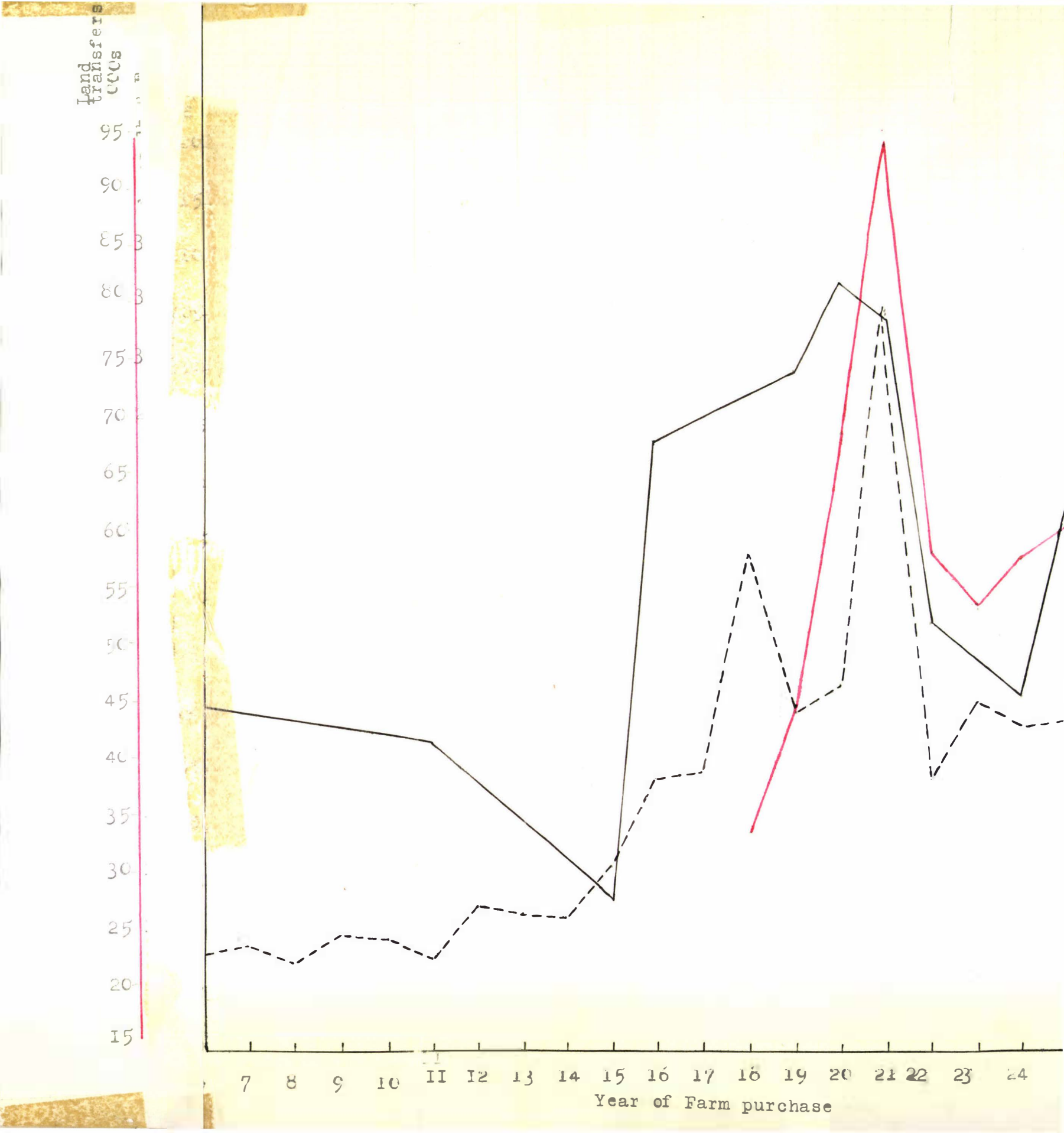
From the above analyses it is concluded that there is a general difference in the extent of investment per cow as between farms differing in the type of contract. Also between farms differing in the nature of supply. When the farms are sub-classified into different contracts and supply groups, however, these differences may be lost. There is, though, a significant difference between 1/2 and 1/3 share farms, no matter what the supply, (at the 20% and probably the 10% levels), and between cheese and butter farms, no matter what the contract, in the extent of investment per cow.

The difference between the contract groups is attributed to differences in area and herd size of these groups (See p.13..). The smaller farms, which are the 1/2 share farms, spread a similar capital investment over a smaller number of cows. The differences between cheese and butter farms are attributed to the greater investment in transport and shed equipment on the cheese farms. This higher rate of investment is not cancelled out by a lower investment in piggeries in the Waikato area, as many cheese supplying farms are as well equipped as butter farms with piggeries. The dried milk supplying farms appear to have a lower average investment per cow than the cheese farms. This would indicate that the higher shed investment in the former is more than cancelled by a lack of investment in pigs or piggeries (if they have been supplying dried milk under contract for some length of time, as was the case with the majority of farms surveyed.) This difference between cheese and dried milk farms, however, appears to be non-significant.

(b) Capital Investment in Relation to Date of the Farm. Purchase.

From graph 11.. it will be seen that both the half and the third share farm groups were purchased over a similar period of time. In both groups approximately twice as many farms were purchased after 1928 as prior to that date. 1928 is the median year of the graph when the omitted purchase is included. Any differences between the two groups in the amount of capital investment is, therefore, not due to an uneven number of farms being purchased at a low price period.

If, however, the farms for which both the farm owner and the sharemilker have supplied data, are grouped according to the year of their purchase and the average investment per cow for each of these year classes is plotted against the year of purchase, the resulting curve will resemble, in outline, the N.Z. trade cycle curve. In graph 12. the average investment per cow up to the time of the


Land transfers CCCs
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
Year of Farm purchase

Graph No 12.

Investment per Cow (Owner plus Share-milker) as at 15/I/46 and the average payout per lb B.F. in the year that the Farm was purchased.

Farms classified according to the year in which they were purchased.

survey has been plotted against the year in which the farms were bought. Plotted against year in the same graph are that year's transfers of land, in 000s, (2) and average butterfat payout in pence per lb. B.F. (4). It should be noted, however, that while there is a general relationship between transfers of land, average butterfat payout, and capital investment, two sets of the data refer to one twelve month period and the other refers to a different period. The B.F. payout figures apply to the end of the dairy season in the year mentioned. Transfers of land (both by conveyance and memoranda of transfer) and the capital investment figures, on the other hand, refer to the end of the official statistical year (2) which comes some six months later. There is therefore a 'time lag' between the former and the latter sets of data, and it is the latter set which 'lags'. This time lag of six months is demonstrated in the following example.

1st June — 31st May

B.F. payout

1st Jan. — 31st Dec. (Transfers of land (Capital investment

1918 — 1919

1919 — 1919

The data compounded in graph 12. was analysed to determine the significance, if any, of the correlation between the curves. The method adopted was that of tabulating the data in sets of two, regarding each as a time series, and analysing for the correlation coefficient by the following formula. (See app. V for working data).

$$r = \frac{Sxy}{\sqrt{Sx^2 \times Sy^2}} \qquad (7)$$

where

$$Sxy = SXY - \frac{(SX)(SY)}{n}$$

$$Sx^2 = SX^2 - \frac{(SX)^2}{n}$$

$$Sy^2 = SY^2 - \frac{(SY)^2}{n}$$

The results of these analyses indicated that the number of transfers of land in each calendar year was significantly correlated with the average Dominion B.F. payout for the twelve months ending six months earlier (see sample above).

$$r = \frac{Sxy}{\sqrt{Sx^2 \times Sy^2}}$$

$$= \frac{1819.1}{2405.9}$$

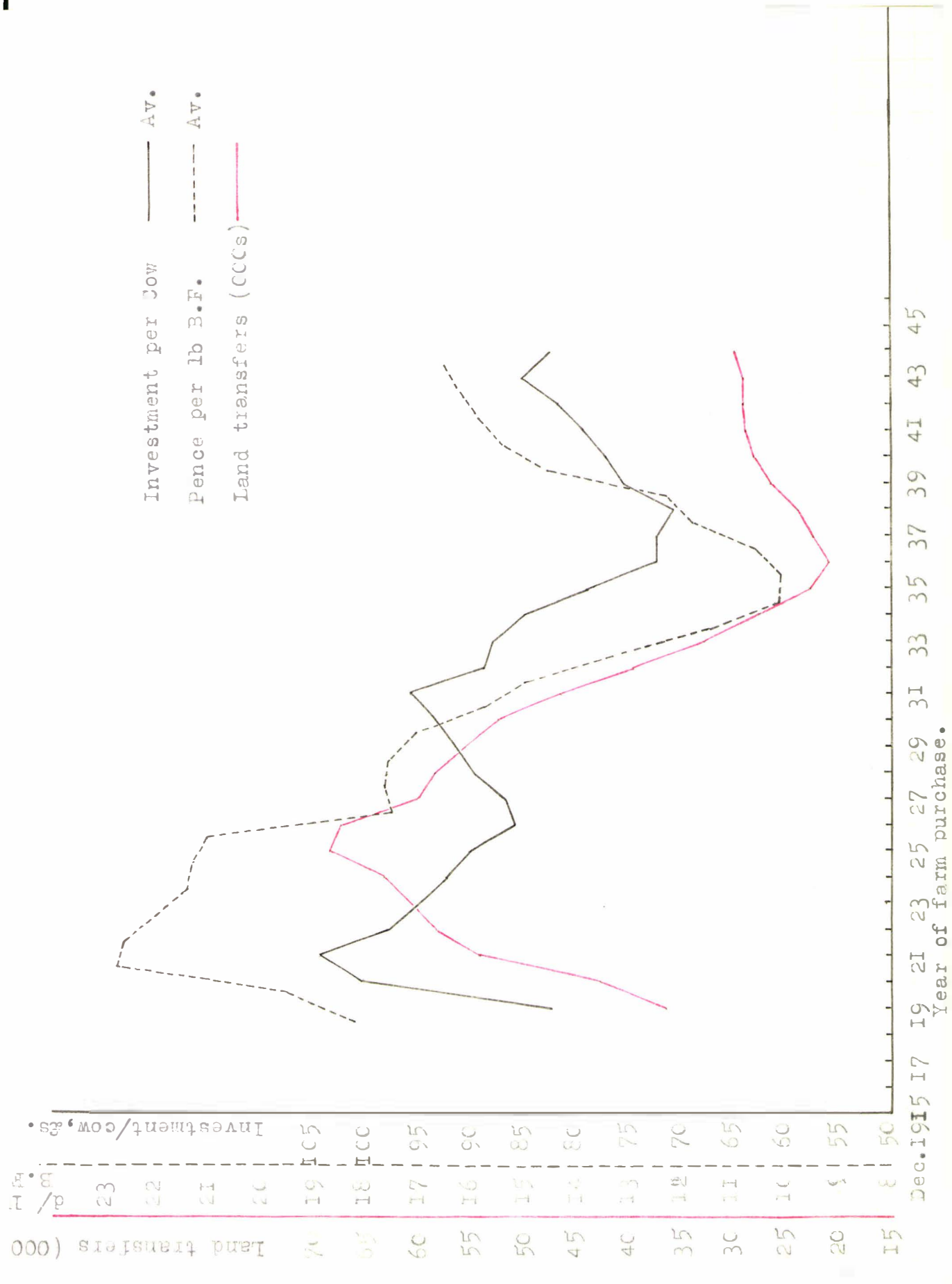
$$= .756 \pm .079 \text{ P.E.}$$

(The 1% level for this value of n is .456)

Graph No 13.

Relationship of Investment per Cow, Transfers of Land and the B.F. payout at the time of the Farm purchase. Farms classified according to the date of purchase.

All data reduced to five year end point moving averages.



Furthermore, the average investment per cow, up to the time of the survey, was found to be significantly correlated with the average B.F. payout for the year in which the farm was purchased. The time lag in the analysis was again six or seven months.

$$r = \frac{833.2}{1708.5}$$

$$= .488 \pm .149$$ which is significant at the one percent level.

(the 1% level for this value of n is .478.)

It is suggested that the course of events is as follows. Fluctuations in the payout for B.F. materially affect the demand for land, and hence the rate of land transfer. The variations in the demand for land, in turn, affect the level of investment per cow. Moreover fluctuations in the purchase of farms have a greater effect upon the level of capital investment today than do the minor variations in the rate of capital accumulation since the date of purchase. In order that fluctuations due to the relatively small size of the sample, could be eliminated from the analysis, the graphs and calculations were repeated after the data had been reduced to five year end-point moving averages.

Graph I3.. presents the same picture as graph I.2. except that the curves have been plotted from end-point moving averages and the average payout curve has been plotted on the half year. That is, the average payout curve has been moved back half a year to bring the corresponding months of each curve into line. When the correlation coefficients of these moving average data were determined, (App.V for working data), the level of significance was increased in each case. With the moving average of the average B.F. payout and transfers of land (six months time lag) the coefficient of correlation, r, equalled .858 ± .121

(the 1% level for this value of n=49)

The correlation coefficient between the moving average of the average B.F. payout and investment per cow is .700 ± .09 when the time lag is six months.

(the 1% level for this value of n is .496)

There is, despite the high values of r, one qualification to be made about these analyses. The method used presupposes a tendency line and Sx^2 and Sy^2 are each the squares of the deviations from that tendency line. The presupposition of a tendency line, or mean line, implies that this analysis must be regarded as a long term one and not a measure of the year to year movement. The averages are moving averages and the correlations are correlations of moving averages and not

correlations of the deviations from the moving averages.

In order to find the extent of any time lag between payout and either investment per cow or transfers of land, a third pair of correlation co-efficients was determined. B.F. payout for the period ended June in each year was correlated with both investment per cow and with the transfers of land (000's) for the period starting six months later and ending eighteen months later. That is, the correlations were made when the time lag was eighteen months. In both instances r had a higher value than previously. In tabular form the three pairs of correlation coefficients are as follows:-

Correlation	B.F. payout with transfers of land	B.F. payout with investment per cow
Unsmoothed data (6 months time lag)	r = .756 ± .079	r = .488 ± .046.
Smoothed data (a) 6 months time lag	r = .858 ± .121	r = .700 ± .099.
(b) 18 " " "	r = .934 ± .026	r = .715 ± .102.

From this it is concluded that the amount of capital investment in farms is influenced, via the demand for land, by the average B.F. payout in the years immediately preceeding the years in which the farms were purchased. The expected future earnings of the farms tend, apparently, to be regarded as similar to their earnings in the immediate past.

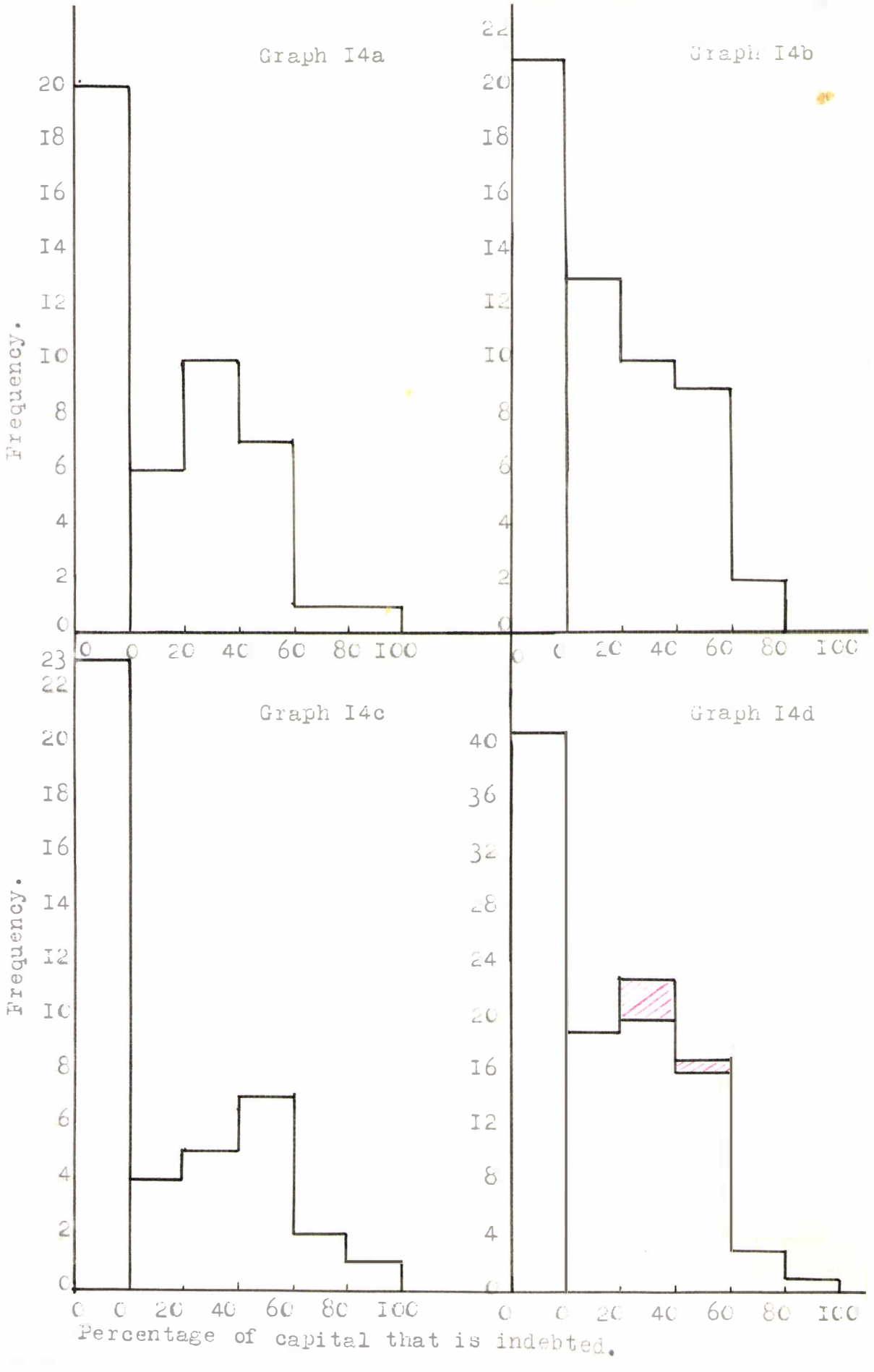
CAPITAL INDEBTEDNESS

It has been stated previously that, for the purposes of this analysis, capital investment in the farm includes all moneys converted into fixed assets. It is in fact the amount of capital controlled by either the farm owner or the share-milker. Equity capital, as distinct from this control capital, is the amount of the farm owner's or the share-milker's investment minus that part held under mortgage, overdraft or lien on stock and chattels. It is the unencumbered capital of the owner or the share-milker. Capital indebtedness is that part of the investment which has been invested by any person other than the farm owner or the share-milker (or by the vendor in the case of a vendor mortgage). The term 'percentage capital indebtedness' refers to the encumbered capital at a percentage of the controlled capital, not at a percentage of the equity capital. The factors

Graph No I4

Frequency distribution of percentage of controlled capital held under mortgage.

Half share Owners, I4a
Half share-milkers, I4c
Third share Owners, I4b
Third and Half share Owners, I4d
(Quarter share thus ////.)



affecting the absolute and the relative amount of capital indebtedness are the type of contract and the period of ownership of the property, or the stock and implements in the case of a 1/2 share-milker.

(a) Farm owners.

Table 14. Distribution of capital indebtedness between 1/4, 1/3 and 1/2 share farm owner groups.

Contract	Encumbered farms	Unencumbered farms
1/4 share	4 = 100%	Nil = 0%
1/3 "	34 = 62%	21 = 38%
1/2 "	25 = 56%	20 = 44%
All contracts	59 = 59%	41 = 41%

In Table 14 it will be seen that in all three contract groups there are considerably more farm owners with some capital indebtedness than without any. This is probably due to the fact that more farms have been purchased since 1928 than before that date, (see graph .11.) and there just has not been time to pay off the indebtedness. Graphs 14a,b,c,d illustrate the repayment tendency by showing that, in each of the contract groups, there is a fairly uniform increase in the number of items within each class as the percentage of controlled capital held under mortgage declines. In graph 15. the actual average capital indebtedness (farm owner) and the percentage capital indebtedness at the time of the survey has been plotted against the date of purchase of the farm. The average B.F. payout has also been plotted against each year. All data are five year end-point moving averages. In this graph the general trend of the actual and the percentage indebtedness curves is opposed to the curve of average B.F. payout.

When the time lag between payout and date of purchase was six months, the actual indebtedness at the time of the survey was found to be non-significantly correlated with the payout.

$r = -.307 \pm .182$ (the 5% level for n = 25 is .388)

The percentage indebtedness of the farm owner's capital was, however, significantly negatively correlated with the payout when the time lag between payout and date of purchase was again six months. Significance is at the 1% level.

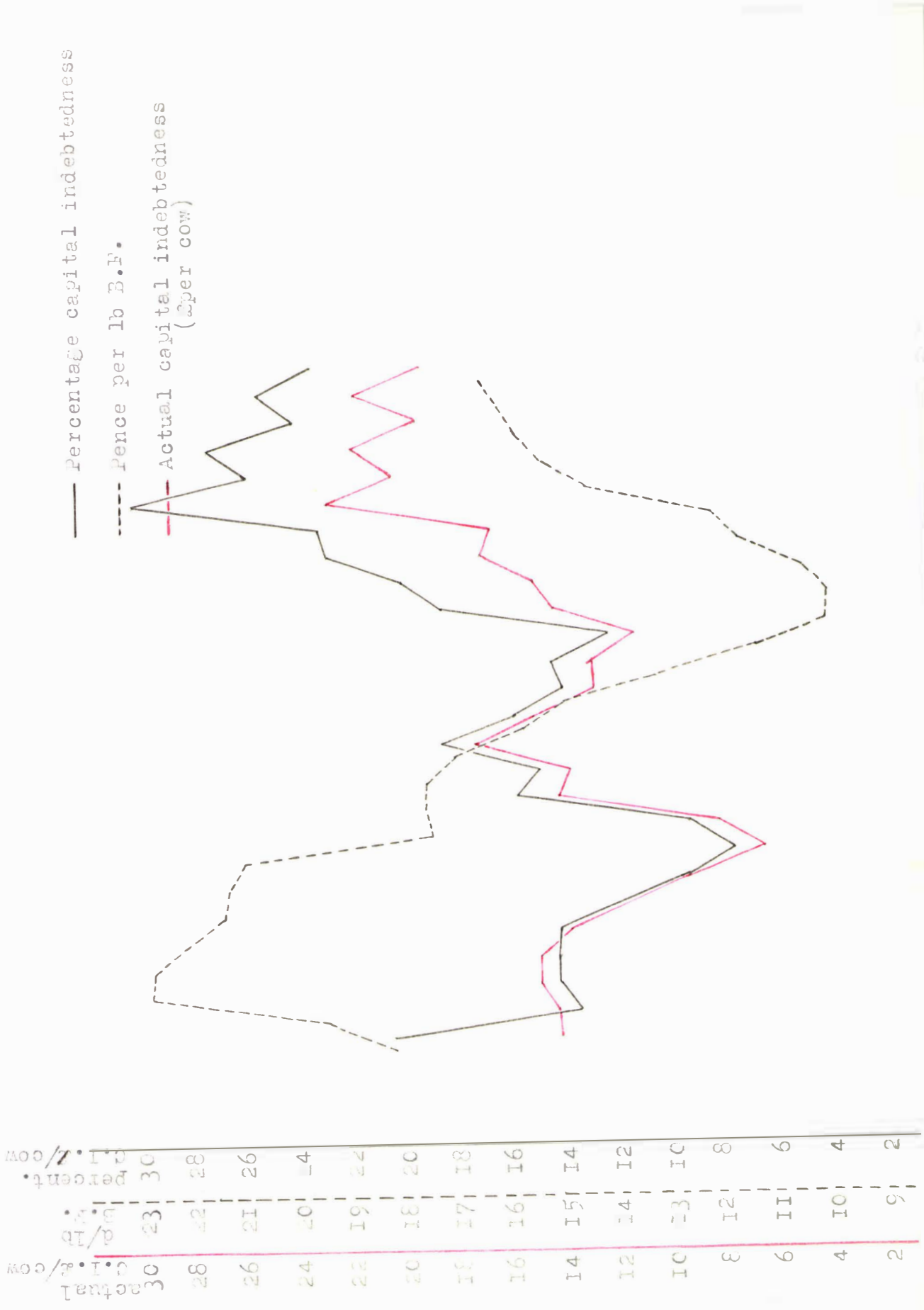
$r = -.565 \pm .139$ (the 1% level for n = 25 is .496)

Graph No 15

Relationship between capital indebtedness, percentage capital indebtedness and the average payout for butterfat at the date of farm purchase.

Farms classified according to the date of purchase.

All data reduced to five year end-point moving averages.



Similarly, the actual and the percentage capital indebtedness at the time of the survey were found to be significantly negatively correlated with the B.F. payout when the time lag between payout and purchase was eighteen months. Significance was at the 1% level in each case. r equalled - .574 ± .083 and - .744 ± .107 respectively. (The 1% level for n = 24 is .505) A further correlation analysis of the capital indebtedness in 1946 (farm owners) with the number of years that the farm has been owned, indicated that the larger the period of ownership the lower the percentage of capital indebtedness in 1946. Significance was at the 1% level.

$$r = -.744 \pm .091.$$ (the 1% level for n = 25 is .496)

There was no reason to suppose that a person buying a farm in the boom years had any more equity capital with which to make the purchase than a person buying in the slump years. It was expected, therefore, that the person buying in boom times would have a greater absolute and greater percentage capital indebtedness than a person buying in the slump years: i.e. the level of capital indebtedness would be postively influenced by the B.F. payout. Instead of this, it was negatively influenced in the present sample. The explanation of the opposing tendencies can be seen in graph I.5. where the payout curve falls over the greater part of the period under review. This downward trend of the payout curve opposes the trend of the indebtedness curve. The latter curve rises as the period of ownership decreases. Any tendency for the data to move in sympathy over the short run, and it is suggested that such a movement is apparent in the graph, is therefore nullified by the long term tendency to move in opposition.

(b) Share-milkers.

In no case did any 1/4 or 1/3 share milker have any stock or chattels secured. The data in this section, therefore, applies merely to the 1/2 share-milkers.

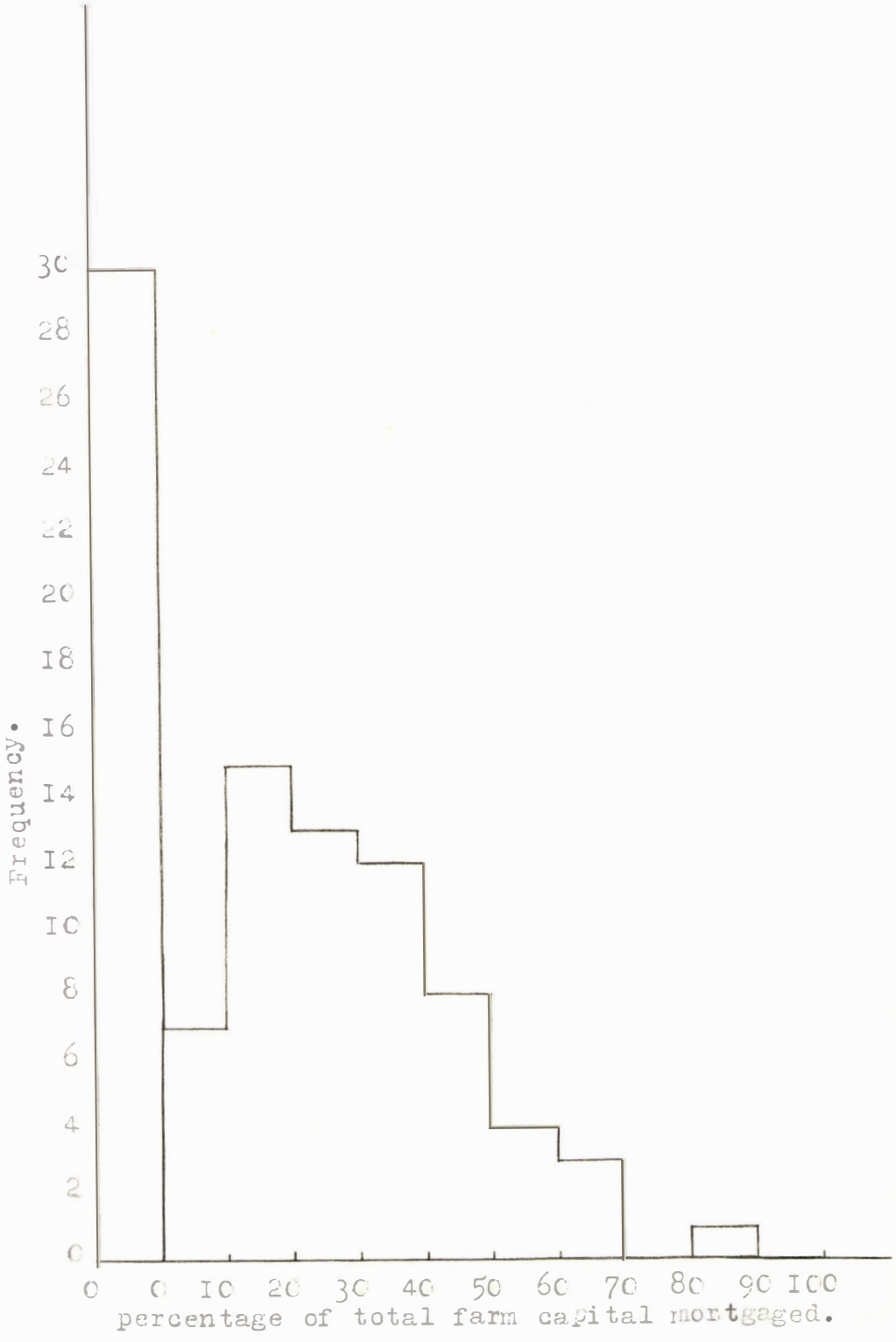
Table 15. Level of Capital Indebtedness of 1/2 share-milkers.

Contract	Encumbered	Unencumbered
1/2 share	19 = 45%	23 = 55%

Graph I.8., as well as illustrating the relatively large number of 1/2 share-milkers that are debt free, illustrates the importance of the 50% stock security. There are only three of 42 share-milkers with more than 40% - 60% capital indebtedness,

Graph No I6

Frequency distribution of percentage capital indebtedness(owner plus share-milker) on the farms where both provided data.



but there are seven with 40% - 60% and nine with less than this. Where the 1/2 sharemilker cannot find all his own capital, he can, usually, borrow up to 50% of the value of the live and dead stock quite readily from a bank, dairy company or vendor. This sum can be, and in most cases is, paid off fairly quickly.

(c) Farm Owner and Share-milker (where both provided data for the same farm)

Table 16. Distribution of Capital Indebtedness between Farm Owner and Sharemilker.

Distribution of Indebtedness	Number	Percentage
Owner and S/M Debt Free	30	32%
Owner free and S/M indebted *	6	7%
Owner Indebted and S/M free	47	52%
Owner and S/M indebted *	8	9%
Number of farms	91 "	100%

* Will all be 1/2 share farms.

" Includes ten 1/3 share-milker interpolations (see p 20.)

Graph .16. is a graph of the frequency distribution of the percentage capital indebtedness where the owner's and the sharemilker's absolute indebtedness have together been calculated as a percentage of the total capital investment in the farm. It shows, as does Table 16 above, that on two-thirds of the farms there is some capital indebtedness. From this graph it will be observed that on most of the farms the percentage of total capital indebtedness is below 50%, and in the majority of cases it is below 30%. The existence of a relatively large number of small mortgages, other than the 1/2 share-milker's stock security, is attributed firstly to long term table mortgages and secondly to present day taxation rates. This latter factor affects the debt structure of the farms in such a way as to make capital accumulation difficult in many cases. The rates of interest charged by the different mortgagees varies quite considerably and depends upon the purpose of the investment and upon its length. In Table 17, below, the common interest rates are shown. These, in practice, may vary somewhat either way.

Table 17. Interest Rates for Long and Short Term Farm and Stock Investments.

Mortgagee	Usual Interest Rate	Nature of Investment
Bank	4½% - 5%	Short and long term
Private	4½% - 5%	Short & intermediate
State	4-1/8% - 4½%	Long term
Dairy Coy.) St. & St. Agency)	5% - 7%	Short term

S E C T I O N IV

LABOUR UTILISATION ON SHARE-MILKING FARMS

GENERAL

Improvements in the technique and intensity of dairy farming have, in New Zealand, been capitalized into higher land values. The effect of this action has been to increase the difficulty with which land may be acquired under freehold tenure. This, in turn, has resulted in the development of the principle of share-milking. Such a method of farming allows, on the one hand, ownership to the landlord without the work of maintenance and management. On the other hand it allows the tenant the opportunity for capital accumulation without the necessity for property ownership. That this type of land tenure and method of labour utilisation has proved advantageous to both landlord and tenant (farm owner and share-milker) is evidenced by the number of farms on which share-milking operates and by the time it has been operating.

As an occupational group, share-milkers may be classified into two general categories. This classification is made purely on the basis of current observations and past statements by writers such as Belshaw (9), Stephens (6), and Doig (3). It is not statistical in nature. In the first category are found those share-milkers who regard their occupation merely as a method of employment and who, for some reason, do not aspire to land ownership. Just how important numerically is this section of the community it is difficult to ascertain, but it is suggested that the permanent share-milker today ranks higher in importance than he did in the early days of the industry. There is some evidence, that in the Waikato at least, the ranks of this class of share-milker were swelled during the war and the immediate post-war period by families whose principal object was the acquiring of a house in which to live. To what extent these temporary sharemilkers are staying in the industry is unknown. The possibility is, however, that they are reverting to previous occupations. The second category comprises those sharemilkers who have farm ownership as their eventual aim. That this aim has, in the past, been realised to a considerable degree, is evidenced by the number of established farmers who at one time or another were sharemilkers. That sharemilking, as a path to ownership, is not as certain as it is popularly supposed to be, is evidenced by the writings of Doig (3), Stephens (6) and Belshaw (9).

It would appear that, in the past, the practice adopted was for the share-milker to engage in 1/3 share farming in order to build up enough equity to purchase a herd and, if necessary, some implements. After this, by half-share-milking, he could clear the stock and implements, build up some money assets and move on to farm ownership. Included in this group are those sharemilkers who desire farm ownership and who, for various reasons, cannot immediately achieve this aim. Apart from the present temporary check due to land shortage, there is the serious check for many caused by a difficulty of capital accumulation, accompanied by an increased amount of capital necessary. So long as improvements in management and technique are capitalized into higher land values, rather than into added labour reward, there can be no easing of this difficulty of the provision of adequate capital.

Share-milkers as a labour group have certain characteristics differentiating themselves from other types of agricultural labour. The main differences are:-

(a) The very high percentage of married share-milkers as compared with the high percentage of unmarried farm labour in general. (Table 23)

(b) Associated with (a) is the very high degree of family labour utilisation. (Table 21).

(c) The fact that there is a tendency for sharemilkers to farm properties that are larger than owner-manager farms in relation to the labour available.

This last factor has a tendency towards:-

(a) A high output per labour unit.

(b) A high total farm output but not necessarily a high output per acre. i.e. extensive farming. (Section VI).

(c) Lowered maintenance standards.

It is an almost universal opinion that the standard of share-milker's maintenance work is below that of the ordinary farmer. This is, as has been mentioned before, purely a qualitative comparison and very difficult to measure. Such a tendency, however, would, it is reasonable to expect, be accentuated by the yearly tenancy so common in sharemilking. It is a common observation that yearly tenures of all kinds are associated with poorer maintenance and other results of the predominance of short term over long term interests. c/f England, U.S.A. In this respect, both the owner and the sharemilker must accept responsibility for any lowered maintenance standards.

OUTPUT PER FULL-TIME MALE LABOUR EQUIVALENT

The output of B.F. per unit of labour can be analysed in two ways. Either as output per full-time labour equivalent or as output per unit of milking-shed labour. The former method will take into account the share-milker's own labour, the farm owner's labour, if any, employees' labour, both full and part time, and family labour, both full and part time, It will be the per unit of labour associated with the farm maintenance. It is derived from data collected from the owners and from the share-milkers where both provided information for the same farm. The latter method will take into account only the labour that is under the direction of the sharemilker during milking, and, as such is confined to output per sharemilker plus family, plus employees. It does not take into account any casual or farm owner labour, except in so far as these are used for milking.

(a) Output per full-time male labour equivalent.

The mean output per full-time labour equivalent on all the farms on which both owner and sharemilker provided information was 8,900 lbs. B.F. With a standard deviation of 2173 ± 181 lbs. That is, in two thirds of the total sample, the total output was found to fall within the range 8900 ± 2173 lbs.

Table 18. Mean output per full-time labour equivalent (lbs. B.F.)

Supply		Butter	Cheese	Dried Milk
Contract	1/2 share	9605	8426	9992
	1/3 share	8069	9558	8416
	1/4 share	7297	10962	-

An analysis of variance applied to the means in Table 18 indicated that the variation within each group was significantly greater than the variation between any combination of the groups. The tables have not been included in this section but will be found in App.V. Too much importance should not be placed on the 1/4 share figures, as they represent only four items. Within the 1/3 and 1/2 share farm groups, however, it will be observed that there is a fairly uniform difference between the mean output per labour equivalent and the output on which a guaranteed price structure is built. It is suggested that, rather than this excess production being merely a source of profit, it is a requisite

Graph No I7a

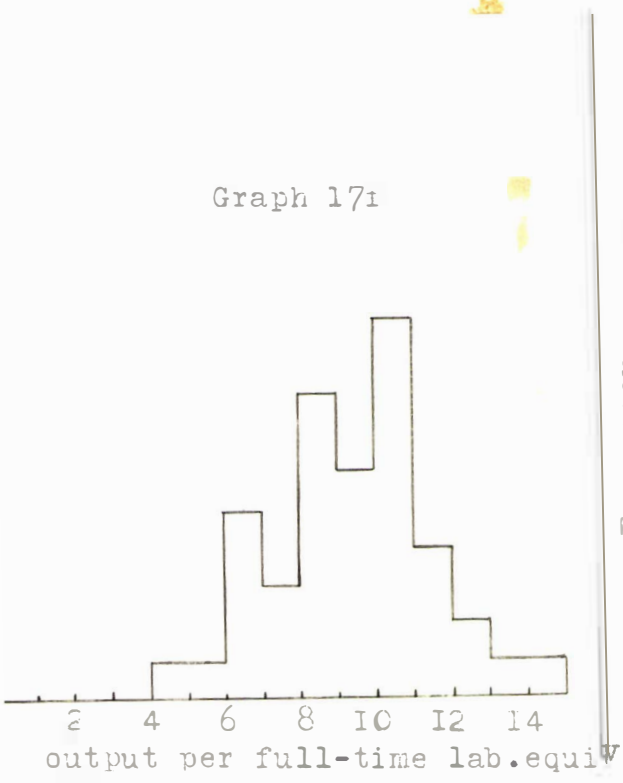
Cutput per unit of shed labour.
Half share farms, I7b
Third share farms, I7c

Graph No I7d

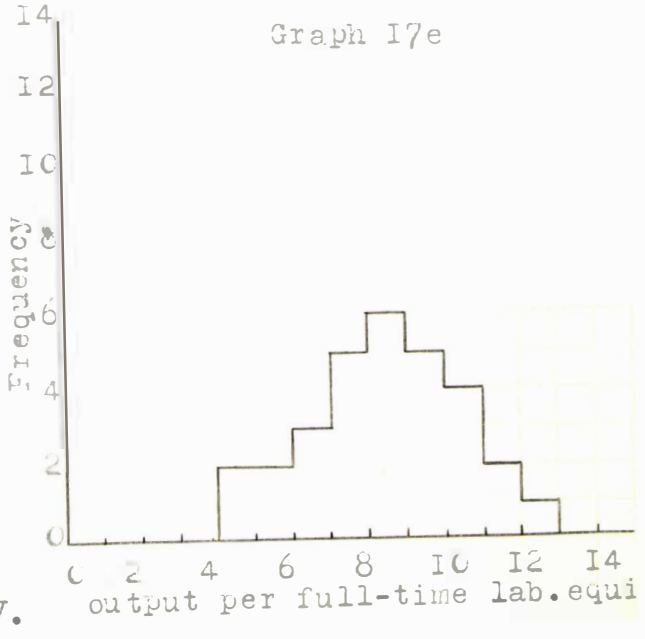
Cutput per full-time male labour equivalent

Half share farms, I7e
Third share farms, I7f

Graph I7d



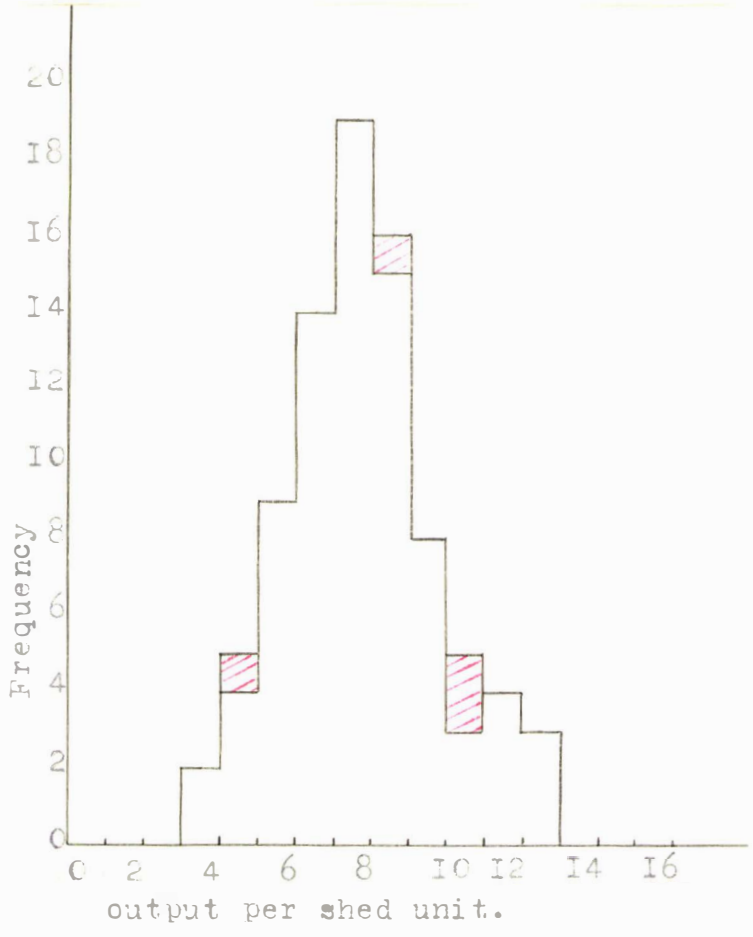
Graph I7e



Graph No 18a

Output per unit of shed labour.
(All farms)

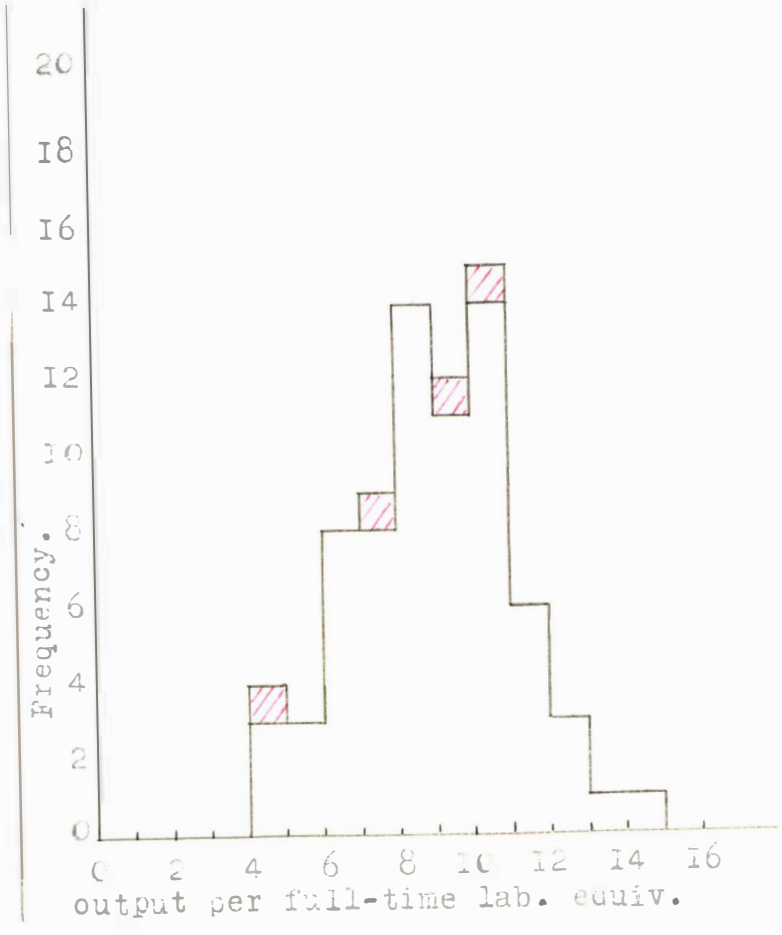
Quarter share farms thus ////.



Graph No 18b.

Output per full-time male labour equivalent.
(All farms)

Quarter share farms thus ////.



of solvency. This applies especially on the smaller farms producing below 12,000 lbs. B.F. The difficulty in applying guaranteed price standards to share-milking farms, lies in that, on these farms, two persons, owner and S/M have to share in each 6,000 lbs. B.F. produced. (see Section V). It is certain that if the production on share-milking farms was not higher than 6,000 lbs. per labour unit, the payment to capital and labour would be considerably below transfer earnings (Section V).

(b) Output per unit of shed labour.

An analysis of variance applied to the 1/2 and 1/3 share means in Table 19 indicated that there was no significant difference between the contract groups but that there was significance between the supply groups. Significance was at the 5% level.

Table 19. Mean output per unit of shed labour.(lbs. B.F.)

Supply		Butter	Cheese	Dried Milk
Contract	1/2 share	6,452	8,340	8,323
	1/3 share	8,040	7,491	8,976
	1/4 share	7,884	10,998	-

Furthermore, there appears to be a degree of interaction between supply and contract. The level of significance of this inter-action, however, is only at approximately the 10% level. (Tables not available). If there is inter-action between the supply and contracts it is suggested that the cause is the low output per shed unit on the 1/2 share butter farms. If there is a difference between supply groups, exclusive of inter-action, the indication is that there is some degree of locality variation. The dried milk farms would be from the highest producing areas and the butter farms, in the main, would be from the lowest producing areas. This impression was not gained during the period of data collection, but a larger sample subjected to more detailed analysis may prove it to be correct.

Table 20. Analysis of Variance. Output per unit of shed labour on 1/2 and 1/3 share farms supplying Butter, Cheese and Dried milk factories.

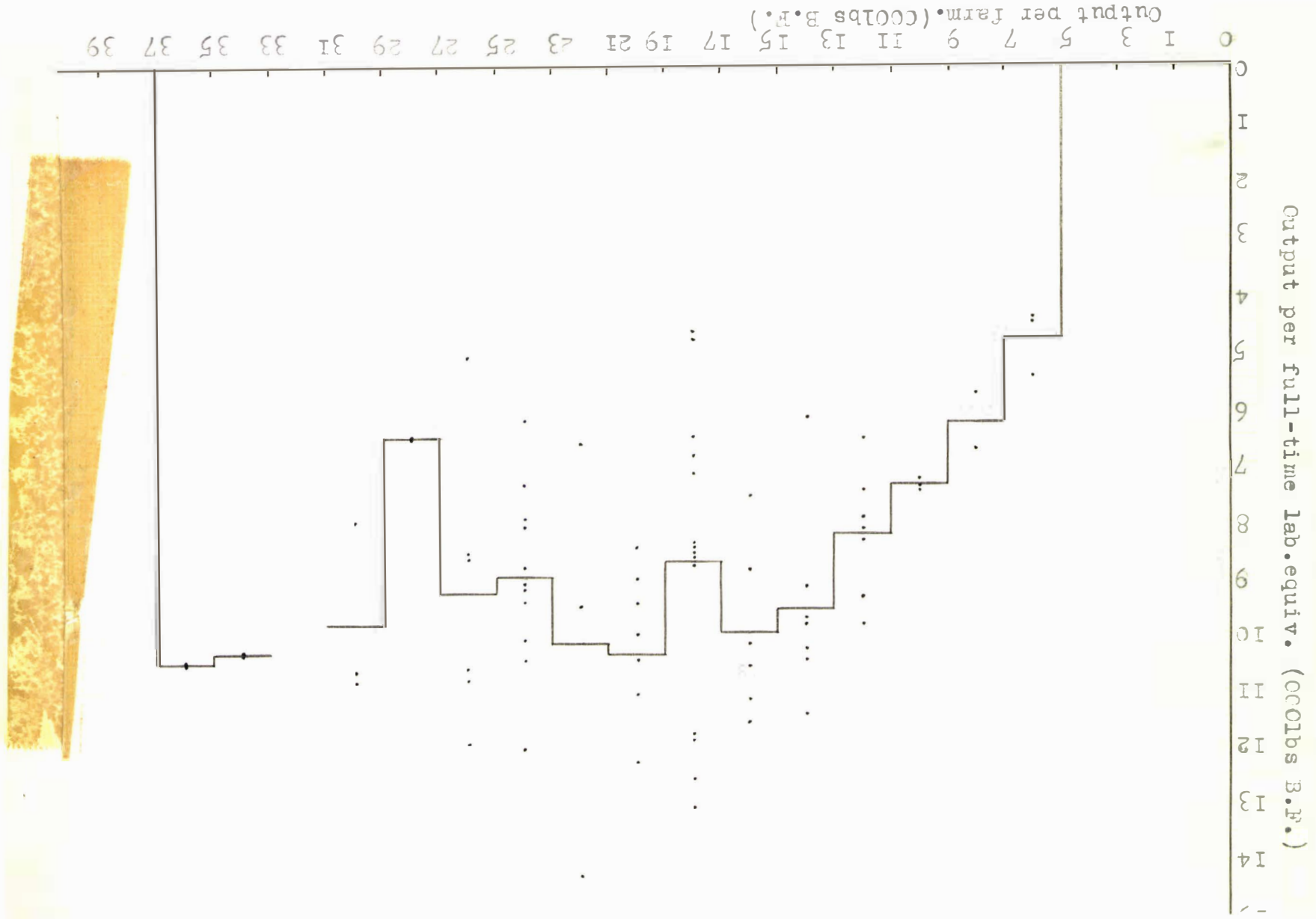
Sources of Variance	d.f.	S.S.	M.S.	F.	Sign
Sub-classes	5	3,805,690			
Between Contract	1	322,900	322,900	1.21	N.S.
Between Supply	2	1,971,210	985,605	3.69	S.
Interaction	2	1,511,450	755,725	2.83	* N.S.
Error	74		266,681		

* Significant at the 10% level only.

Graph No 20

Output per full-time male labour equivalent in relation to size of the total farm output.

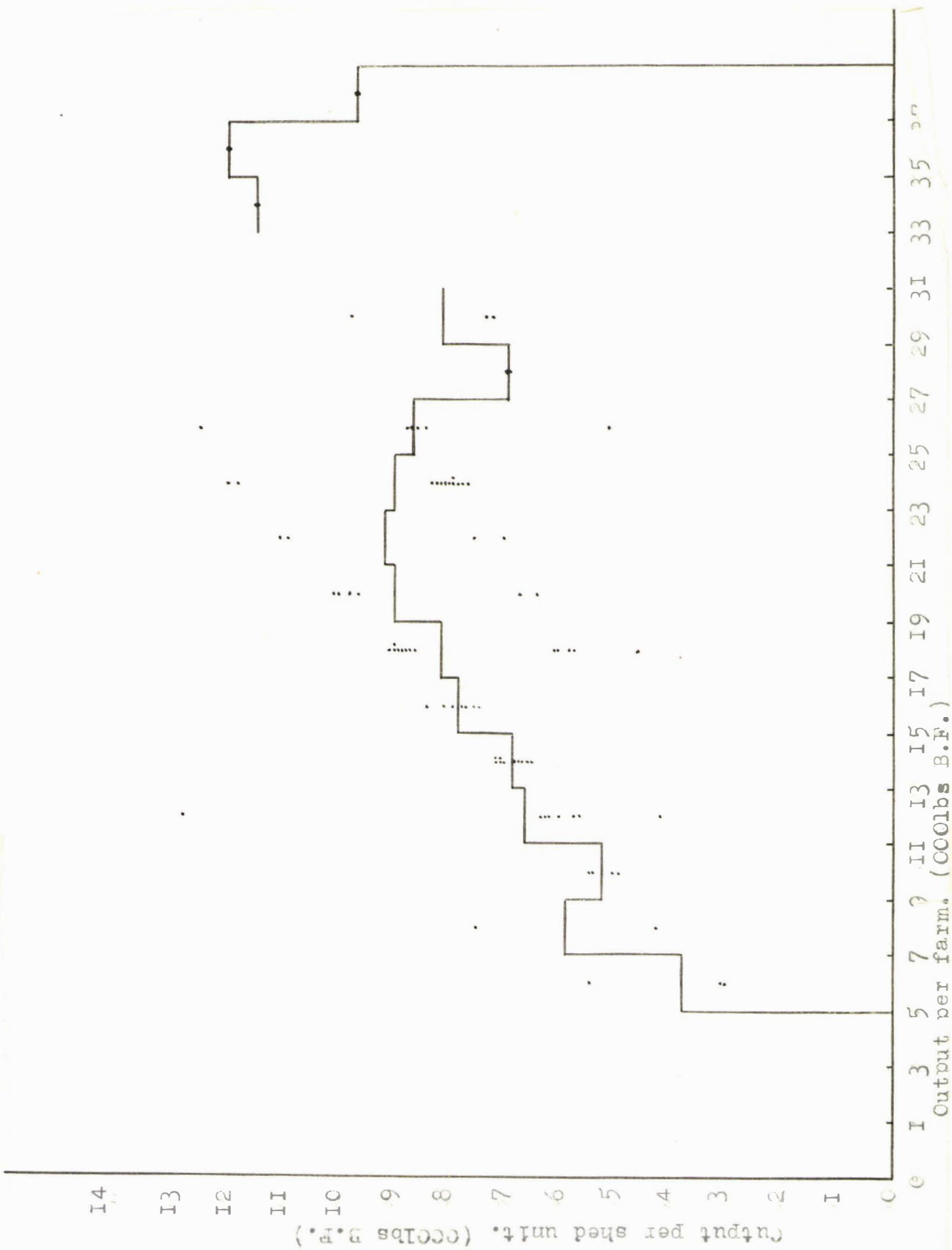
Plotted in each class interval are the individual items making up the class average.



Graph No I9

Output per shed unit in relation to size of the total farm output.

Plotted in each class interval are the individual items making up the class average.



Graphs 17.18 illustrate the frequency distribution of the varying outputs per labour equivalent and per shed unit between the contract group. It will be observed from these that there is generally a higher output per full-time labour equivalent than per shed unit. The cause of this is the classification of part-time family labour as whole units of shed labour, on the one hand, and as fractions of full time labour equivalents on the other hand. The difference between the two types of output is an indication of the labour structure on share-milking farms. It measures the reliance placed on part time family labour for the essential work of milking. (See Section V). This part time milking labour may be paid labour or it may not, but the income nevertheless accrues to members of the family. As, in the majority of the cases, this extra shed labour was supplied by the share-milker's wife (unpaid labour), the difference between these outputs represents a real gain to the family income. The gain is somewhat under-estimated, however, as this unpaid labour has been included fractionally in the output per full time labour equivalent.

OUTPUT PER LABOUR UNIT IN RELATION TO SIZE OF TOTAL OUTPUT

In general, the output per labour unit, both full time and shed labour, increases as the farm increases in size. To illustrate this in graphs 19... and 20.. the farms were classified by size according to total output. The class intervals are 5,000 to 6,999.4, 6,999.5 to 8,999.4 lbs. etc. and the output per labour unit is the average for each of these classes. Individual farm outputs are also plotted within each class interval.

A comparison of graph 19.. with graph 20... reveals that the output per full time labour equivalent increases very rapidly between the total output range 5,000 to 14,999.4 lbs. The output per shed unit over a slightly larger range, 5000, to 20,999.4 lbs., however, increases much more slowly. Both outputs tend to remain more constant as the output increases above these points. The difference in rate of increase in output in the early stages, can be attributed to the fact that up to an output of about 15,000 lbs. the milking tends to be done by a married couple alone. If the total output is divided by the two shed units, the rate of increase, while uniform, is less marked than if the total output is divided by, say, 1.3 full time labour equivalents. After this output of approximately 15,000 lbs. B.F. has been reached, there

is an increase in the number of full time labour equivalents, including the owner's labour, per farm. As a result, the increase in the output per full time labour equivalent per class interval is not so marked. As will be seen later, the amount of farm owner labour on the third share farms is considerably more than on half-share farms. Furthermore, these third share farms tend to be associated with the larger output groups. (Section 3). The effect of this is, that as the total output of the 1/3 share farms increases, the increase in the output per full-time labour equivalent is not so rapid as the increase on 1/2 share farms.

PROVISION OF LABOUR

The utilisation of family labour, especially wives, for farm work is no new feature of dairy farming in New Zealand. Both Doig (3) and Hamilton (4) comment on this fact. Doig (3) furthermore, makes particular reference to the amount of farm work done by sharemilkers' wives. It has been stated earlier in this study that the structure of sharemilking appears to be built on a foundation of family labour in association with large herds. The following sections attempt to illustrate the former part of that statement. Evidence for the latter part is to be found in the sections which dealt with the size of the farms and their output. No attempt has been made to analyse the hours worked by family labour. The data was collected, but has been used solely for the purpose of determining the wage equivalent of that labour for the analysis of incomes in Section V. The subject of the hours of work has been adequately covered by Doig (3).

(a) Type of Labour Provided by Share-milkers.

In Table 21 the term 'hired labour' refers to non family hired labour. Family labour - sons and daughters - may be hired in the sense that wages are paid for it, but to give an indication of the family nature of sharemilking labour it has been excluded from hired labour.

Table 21. Labour utilised in Milking. (excludes 1/4 share farms).

Type of Labour	Contract	
	1/2 share	1/3 share
Share-milker alone.	3	0
Share-milker and wife.	20	15
Share-milker, wife and family	3	3
Share-milker, wife, family and hired labour	0	0
Share-milker, wife and hired labour	4	8
Share-milker, family and hired labour	2	0
Share-milker and hired labour	6	11
Share-milker and family	5	10
Totals	43	47

From this table it will be seen that family and hired labour tend to be associated with the 1/3 share farms. These, in turn, tend to be the larger farms. On the 1/2 share farms, share-milkers or share-milkers and their wives milked more than half (23:43) of the herds. It was only on a third (15:47) of the 1/3 share farms that this was the case. In the latter type of farming the herd is usually milked by more than two persons. Table 22 summarises the labour utilisation on the same farms in a slightly different way.

Table 22. Labour Utilised in Milking (excludes 1/4 share farms)

Number of wives who milked	53	60%
Number who didn't	37	40%
Number of sharemilkers who used family labour of some sort (wife, son, daughter).	70	78%
Number of sharemilkers who did not use any family labour *	20	22%
Number of sharemilkers who employed non-family labour (permanent)	31	34%
Number of sharemilkers who did not employ non-family labour. "	59	66%

* Includes three farms where no labour other than the sharemilker was employed.

" Or else only for casual work.

The non-family labour in the table above refers only to full time labour. On nearly all of the farms, however, non-family labour other than the farm owner, was employed for casual work. In that respect Table 22 gives a somewhat erroneous picture of the non-family labour employment. The outstanding features of this analysis are the high percentage of farms on which the wives helped in the shed, and the low percentage of farms employing full-time non-family labour. Table 23 shows the difference between sharemilking farms and all dairy farms in respect to these two types of labour.

Table 23. Labour Utilisation on Share-milking farms and Other Dairy Farms.

Type of Labour	S/M. Farms	Other Dairy Farms *
Percentage of farms on which wives helped in the shed.	60%	32%
Non-family employees as a percentage of the farms surveyed	35%	53%

* Ex. Table 1, P. 50, N.Z.D.S.I.R. Bull. 75 (3). The percentages obtained in this column are derived from the number of persons in the respective categories as a percentage of the number of the farms surveyed. The remaining section of Table 22 illustrates the high degree of reliance placed on all types of family labour.

Share-milking labour is essentially a family unit and, whether wages are paid or not, the income is kept within the members of the family.

(b) Labour Provided by the Farm Owner.

Table 24 illustrates the extent to which farm owner labour is provided for the farms. The term 'labour' applies purely to the physical labour of maintenance or developmental work.

Table 24. Distribution of farm owner labour between contract groups. (excludes 1/4 share farms) *

Contract	Worked part or full time on the farms	Did not work on the farms	Totals
1/3 share	24	31	55
1/2 share	6	40	46
Totals	30	71	101

* The farm owner worked on all four 1/4 share farms.

The difference between the two contracts in respect to owner labour is inseparably bound up with the nature of the two contracts and with the place of residence of the owner. On the 1/3 share farms, the farm owner was resident in many more cases than on 1/2 share farms. Coupled with this is the fact that on 1/2 share farms the sharemilker is virtually the manager of the property and the farm owner is, in all but a few respects, purely a landlord. The above table, however, is not necessarily an indication of the management exercised by the farm owners. It is rather an indication of their occupation: retired, investor or farmer. The table excludes most managerial labour such as visiting the farm, policy planning, and supervision. It refers merely to physical labour. Any classification of the farm owners into resident and non-resident must, of necessity, be somewhat arbitrary in nature. A resident owner has been defined as one who actually resides on the farm or immediately adjacent to it. The non-resident owner is defined as one who resides some distance from the property. This classification is fairly loose, but is considerably less open to error than a classification based, say, on the amount of work performed. Table 25, when read in conjunction with Table 24 gives one of the reasons why a much lower percentage of half-share owners worked on the farms.

Table 25. Relationship of the place of residence to contract.

Contract	Resident	Non-resident	Totals
1/3 share	36	19	55
1/2 share	10	36	46
Totals	46	55	101

The importance of the place of residence is secondary to that of the contract in its effect on owner labour, but both are important. The 1/3 share owner, therefore, has a greater opportunity of working on the farm. The extent to which this opportunity is availed of is illustrated by Table 24.

ADDENDUM

Chi-Square of data in Tables 21,24,25.

A chi-square analysis of the date in tables 21,24 and 25 indicated that :-

(a) The number of herds that were milked by the Share-milker or the Share-milker and his wife was not significantly different as between the 1/3 and 1/2 share groups.

$$X^2 = \frac{S(ft-fo)}{ft}$$

$$= 2.4 \ldots\ldots \text{N.S.}$$
(the 5% point of X^2 = 3.841)

(b) The number of farm-owners who worked full or part-time on the farms was significantly greater in the 1/3 share farm group than in the 1/2 share group.

$$X^2 = 7.8 \ldots\ldots \text{H.S.}$$
(the 1% point of X^2 = 6.635)

(c) The number of resident owners was significantly greater in the 1/3 share group than in the 1/2 share group.

$$X^2 = 9.9 \ldots\ldots \text{H.S.}$$
(the 1% point of X^2 = 6.635)

S E C T I O N V

FACTORS AFFECTING THE RETURNS TO MANAGEMENT

In any farming venture the reward earned by management is subjected to a multiplicity of influences. In share dairy farming, however, there is an additional set of influences conditioned by the nature of the enterprise and by the division of the receipts and expenditure between two parties. This study has been confined to an analysis of some of the influences which affect the size of management incomes on sharemilking farms as separate from any farm.

In the introductory section it was stated that the management reward was determined by a deduction of paid out and unpaid out long term costs from the gross income. In some detail the method adopted was as follows. (See App.I for examples).

From the farm owner's share of the gross income was deducted any wages charge, including keep, other than the sharemilker's share of the gross returns and reward for personal labour. This was mainly the owner's share of the casual wages bill, but in the case of the 1/4 share farms it included payments made to the sharemilker for farm maintenance work. The next deduction was rent and interest on mortgage or overdraft. General working costs included items shared with the share-milker, as well as wholly payable by the farm owner. This deduction included the payment made by the farm owner, to the sharemilker, for use of the latter's truck and/or implements in the rare cases where this was charged. The deduction of the repairs and maintenance costs included those payments made for the purpose of maintaining the depreciating capital intact. The stock maintenance charge included payments made for calf rearing and stock purchases, plus an estimated loss for deaths. Each death of a cow was assessed as a loss of £7, i.e. the loss of its boner value. The method of determining the net stock replacement costs was by deducting stock purchases and deaths from stock sales. This takes no account of any increase or decrease in the stock numbers over the year. Sufficient data to determine this variation was not collected. It is contended, however, that as the contracts specified the number of cows to be milked, within a narrow range, the variation between the beginning and the end of the season is not likely to be very large. It is probably of the order of one or two cows, with three as a maximum. In which case the probable level of error in the stock replacement costs, assuming there is variation, will be of the order of £12 to £24, either way.

Depreciation was deducted at income tax exemption rates. In some cases the farmer did not claim a depreciation exemption for taxation. He would claim the difference between the sale or discarding of an asset and its replacement cost. In these cases a depreciation deduction was estimated from the approximate age of the asset and the normal taxation exemption rate. The final deductions were those of rates and land tax. The balance now left approximates the taxable income of the farm owner under a system of double entry book-keeping. From this balance was deducted interest on equity investment at the rate of 5%. The balance now includes the reward of labour and management plus some pure profit. From this was deducted an estimate of the value of the physical work performed by the farm owner. The estimation was based on the proportion of the week that was worked. If e.g. the farm owner worked for 1/3 (2 days) of the week, the value of his labour was assessed at £91 (1/3 x 273) a year. The final balance represents the earnings of management plus pure profit. The former is similar to wages and represents the reward for supervision. In that respect it is a deductable cost against the farm. The balance after deduction of this 'management charge' represents pure profit. An attempt was made to separate these two items but the results proved to be unsatisfactory. (See App. IV). The comparison between the groups of incomes has, therefore, been made by comparing the average 'management-profit' (hereafter called the management reward). As with the sharemilker's income the unit of comparison is the management reward per 1,000 lbs. B.F. From the share-milker's share of the gross income costs were deducted in a way similar to the farm owner's deductions. The only differences in technique lie in the method used to determine personal and 'family' labour charges. In many instances members of a share-milker's family provided help, either full or part time, on the farms. Where they were paid wages by the sharemilker no problem was encountered. This, however, was a minority group and in the majority of cases the help was provided by the wife and consequently there was no wage payment made. Under these conditions an estimate was made of the value of the labour utilised and this sum was charged against the gross income as a cost. The basis of the calculation was the Under Rate Wages Provision of the Agricultural Workers' Act of 1936. The standard adopted was a wage of £2.18.6 (10) for a 63 hour week (10). The actual charge made was dependant on the hours worked per day and the period of the year covered. e.g. if a wife helped in the shed for four hours a day for a period of nine months, the labour charge would be:-

$$\frac{4}{9} \times \frac{9}{12} \times \frac{£2.18.6}{1} \times \frac{52}{1} = \frac{1}{3} \times \frac{£152.2.0}{1} = £51 \text{ (more or less)}$$

The value of the sharemilker's own labour was assessed at £273 a year in all cases.

In App. I will be found a copy of the schedules used with the farm owners and the sharemilkers. With each schedule is provided a hypothetical example of the receipts and expenses payments made by each party to a 1/3 and a 1/2 share agreement. The examples are provided as an illustration of technique and not as an example of the actual cost structure of specific farms.

SOME FACTORS AFFECTING THE FARM OWNER'S MANAGEMENT REWARD

THE EFFECT OF THE TYPE OF CONTRACT AND SUPPLY

On the farms supplying butter factories the chief source of income is from the sale of B.F. and pigmeat. On cheese factory supplying farms of the same output there is a somewhat larger income from sale of B.F., but a considerably lowered income from the sale of pigmeats. On the dried milk farms the income from the sale of B.F. is larger still, but there is no income from the sale of pigmeat. Table 26 illustrates the effect of the different combinations of B.F. and pigmeat income upon the management reward per farm, in the three supply groups. When this reward, per farm, is converted to a management reward per 000 lbs. B.F., however, the difference, while retained, does not appear to be so marked. (Table 27) In the same tables the difference in the mean size of the 1/4, 1/3 and 1/2 share farms is reflected both in the management reward per farm and per 000 lbs. B.F. As would be expected, also, the differences are more marked in the management reward per farm.

Table 26. Average Management Reward per farm. (farm owner).

Contract	Butter	Cheese	Dried Milk	Mean*
	£	£	£	£
1/4 share	628	559	-	611
1/3 share	251	303	454	303
1/2 share	136	331	404	233
Mean *	221	320	429	N - 94

* The averages here are weighted averages.

Table 27. Average Management Reward per 000 lbs. B.F. (Farm owner).

Contract	Butter	Cheese	Dried Milk	Mean *
	£	£	£	£
1/4 share	29.1	16.9	-	26.1
1/3 share	12.4	12.9	17.1	13.0
1/2 share	5.7	18.1	17.4	10.7
Mean *	10.5	13.9	17.2	N = 94

* The averages here are weighted averages.

From these tables it would appear that, because of economies of scale, the advantage lies with the 1/3 and 1/4 share farms. Also, the tables indicate the tendency for the butter farms to be at a relative income disadvantage. Apparently, the production of pigmeat on these farms is not carried on at a level high enough to equalise the compensatory payments paid to the other two supply groups. When the data comprising Table 27 was subjected to an analysis of variance, however, the apparent differences proved to be actually non-significant. The variation within each contract, supply and contract-supply group was enough to either nullify any significant difference between the groups or to reduce it to the 20% level. (See App.V for working data). Tables 28 and 29 which summarise the differences between the contract groups and the supply groups respectively (not sub-classed), indicate that for the reason in the preceding paragraph any apparent effect of supply is non-significant. Furthermore, any apparent effect of the type of contract is significant only at the 20% level.

Table 28. Analysis of Variance. The Three Contract Groups (all supplies included)

Source of Variance	d.f.	S.S.	M.S.	F.	Sign
Total	92 "	21,537.8			
Between Group	2	880.8	440.4	1.91	N.S.*
Within Group	90	20,657.0	229.5		

Table 29. Analysis of Variance. The Three Supply Groups (all contracts included)

Source of Variance	d.f.	S.S.	M.S.	F.	Sign
Total	92 "	21,537.8			
Between Group	2	663.3	331.6	1.4	N.S.
Within Group	90	20,874.5	231.9		

" The inclusion of two sets of data in one reduces N from 94 to 93 and hence d.f. from 93 to 92.

* At the 20% level only.

When the 1/4 share farms are excluded and the analysis is done with the six sub-classes as illustrated in Table 30, the contract difference disappears, but the effect of the supply is seen to be significant at the 20% level.

Table 30. Sub-class Analysis of Variance. 1/3 and 1/2 share farms with three types of supply.

(a) Mean of Sub-classes Table.

Contract	Butter	Cheese	Dried Milk	Mean *
	£	£	£	£
1/3 share	12.4	12.9	17.1	14.1
1/2 share	5.7	18.1	17.4	13.7
Mean	9.1	15.5	17.3	N = 90

(b) Analysis of Sub-classes Table.

Source of Variance	d.f.	S.S.	M.S.	F.	Sign
Subclasses	5	110.62			
Between Contract	1	0.24	0.24		N.S.
Between Supply	2	74.62	37.31	1.76	N.S."
Interaction	2	35.76	17.88		N.S.
Error	83		21.16		

* Mean of an average.

" Significant at the 20% level only.

Of the two analyses (non sub-class and sub-class) the latter is probably the more reliable as it excludes the 1/4 share farms of which there are only four. As, however, the level of significance is only at the 20% level it appears unwise to say any more than that the type of contract apparently did not cause a difference between the farm owners' average management-reward per 000 lbs. B.F. on the 1/3 and 1/2 share farms. This would tend to indicate, that with the division of the gross receipts and expenses commonly found in the two types of contract, prior to the 4th September, 1946 (App.II) the 1/3 share and 1/2 share farm owners received a similar reward for management per 000 lbs. B.F. Furthermore, there does not appear to be any marked difference in the farm owners' average management reward per 000 lbs. B.F. as between butter, cheese, and dried milk supplying farms. There is, however, some indication that those who received compensatory payments in the place of income from the sale of pigmeats were, on sharemilking farms, at somewhat of an advantage.

Table 32. Analysis of Variance. Management-reward per farm of Resident and Non-resident 1/3 share Farm Owners.

Source of Variance	d.f.	S.S.*	M.S.	F.	Sign
Total	53	5,561,324			
Between Group	1	152,128	152,128	1.5	N.S."
Within Group	52	5,409,196	104,023		

* The variance in each group is large because the original data has been coded. In order that all the management-rewards be positive, 600 has been added to each item.

" The 20% level for this value of N is 1.68.

The results of this analysis would tend to indicate that the income available to meet the farm owner's and hence the sharemilker's management reward is unaffected by the farm being owned by a non-resident landlord. This, in turn, would tend to indicate either that -

(a) The resident owners contribute relatively little to the management of the farm - or

(b) The sharemilker on "non-resident owner" farms is capable of exercising some of the management normally exercised by the resident farm owner.

In the absence of data relating to the tasks actually performed by the owner and the sharemilker of these farms, it would be difficult to say which of the alternatives is the more important.

EFFECT OF THE NUMBER OF FARMS OWNED

Any inverse relationship between the number of farms owned by a landlord and income available to pay the management reward on each of them (as indicated by the farms surveyed), would, it is suggested, be due to a dilution of the managerial supervision. In that respect, there is a parallel between this sub-section and the previous one. Just as a non-resident third share farm owner is not in the position to exercise the same degree of managerial supervision as a resident owner, there is reason to expect that the ownership of several farms would result in lowered supervision on each. When all the farms, 1/4, 1/3 and 1/2, are classified according to the number of farms owned by the farm owner, there is no apparent or regular, difference in the average management reward of the several groups.

Table 33. Classification of the average Management-Reward, Owners', by the number of farms owned.

No. of farms owned	1	2	3	4	5	6 & over
Management-reward per farm (£)	301	221	153	820	262	352
n	63	22	5	3	1	5

Examination of the crude data reveals that the variation within each of these groups is considerably greater than any difference between the groups.

When the 1/2 share and the four special case 1/4 share farms are removed from this table, and the management-rewards of the remaining 1/3 share farms are analysed, it is found that the average management-reward per farm of the owner of more than one farm is slightly higher than that of the owner of only one farm. The figures are £315 and £277 respectively. When an analysis of variance was carried out, however, these means were shown to be non-significantly different. (table 34).

Table 34. Analysis of Variance. Management-reward per farm of Owners of one farm and owners of two or more farms. (1/3 share group only).

Means of the sub-classes.

No. of farms owned	One	n	Two or more	n
Av. Management-reward	£277	35	£315	17

nalysis of the sub-classes.

Source of Variation	d.f.	S.S.*	M.S.	F.	Sign
Total	51	4,987,513			
Between Group	1	15,692	15,692	-	N.S.
Within Group	50	4,971,821	99,436		

* In this analysis the items are uncoded. Instead, both positive and negative management rewards have been squared to find SX^2.

The results of this analysis would tend to indicate that neither the owner's nor the sharemilker's management-reward is significantly affected by the number of farms owned by the farm owner. This bears out the findings in the previous sub-section, in which many, but not all, of the resident farm owners were owners of only one farm.

EFFECT OF THE SIZE OF THE FARM ON THE MANAGEMENT REWARD

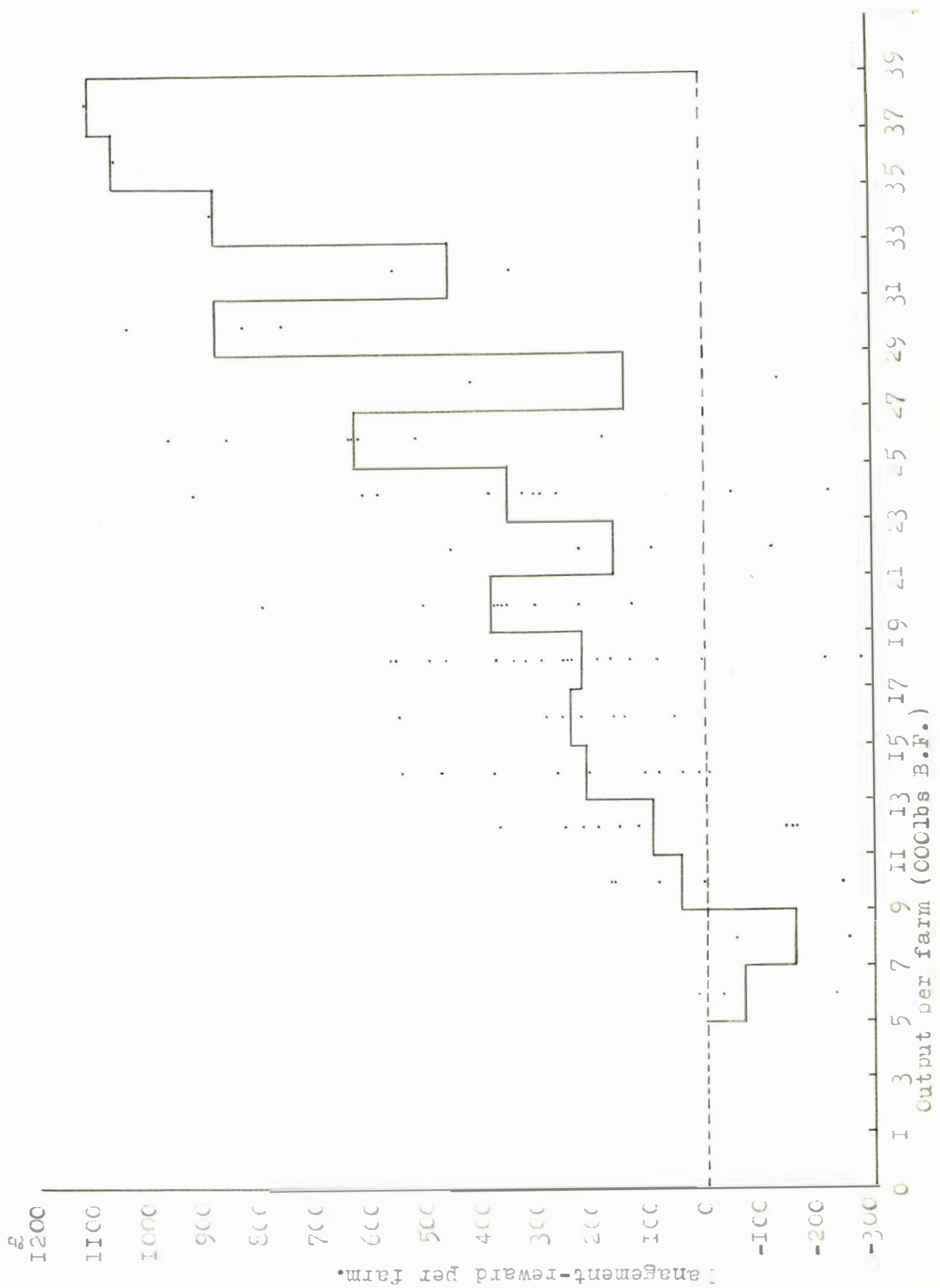
In New Zealand the guaranteed price for butter is a "cost of production" price which takes into account both farm and manufacturing costs. The farm costs section of this price is based upon the somewhat arbitrary farm producing 6,000 lbs. B.F. per full time labour unit, carrying 24 cows per full time labour unit and having a certain cost structure. Furthermore, it is designed for the farm on which the owner is a working manager, and on which any other labour is paid the award wage. Consequently the guaranteed price cost structure does not parallel the cost of production structure of sharemilking farms.

On sharemilking farms, the division of responsibility between two persons, the farm owner and the sharemilker, often results in cost being incurred in excess of the guaranteed price "margin". The more these costs are incurred, the smaller the amount that is left as a surplus for the payment of the management-reward of the party or parties involved. On this latter type of farm, therefore, while there are often economies due to large scale production, there are also diseconomies due to certain costs being incurred in excess of the guaranteed price provisions In a sharemilking contract the division of the working and maintenance costs is specified fairly rigidly, and hence there is little likelihood of any appreciable cost commitment over and above that provided for in the guaranteed price. Furthermore, the payment of capital costs is, with the exception of the relatively low interest costs of the 1/2 sharemilker, the responsibility of the farm owner. If we exclude the added capital cost due to over-capitalisation, common to both owner-manager and sharemilking farms, there can be very little capital cost payment beyond that provided for. There is, however, some considerable opportunity for both parties, and especially the farm owner, to incur both paid out and unpaid out labour costs in excess of this amount provided for. This is due to the fact that the share received by the farm owner is mainly for the payment of fixed costs. If the farm owner works on the farm, therefore, and if such work does not nett him, after deduction of the sharemilker's share of the proceeds, a return at least equal to the costs incurred, his management reward will be reduced. It is suggested furthermore, that because of the nature of the 1/3 and 1/2 share agreements the farm owner will rarely be able to justify,in terms of current income, he himself doing maintenance work. He will have to pay the sharemilker irrespective of who does the work. The farm owner's reward is more likely to be in that he

Graph No 2I

The farm-owner's management-reward per farm in relation to the size of the total butterfat output.

Plotted in each class interval are the items making up the class average.



has something to do or that the farm is being improved. The personal satisfaction that derives from these latter rewards is obviously greater than that which derives from the slightly increased economic "management" reward. In section IV it was pointed out that very half share farm owners work on their farms, but that quite a number of 1/3 share farm owners did work part time. The foregoing remarks, therefore, apply in practice mainly to 1/3 share farms. In particular, they apply to the 1/3 share farm owner on the farm which is small relatively by share-milking farm standards. On the large farms the economies of large scale production are sufficient to outweigh the diseconomies of excessive labour payments. It is for this reason that the total output of the farm, as a measure of farm size, is so important to the farm owner. The effect of the foregoing on the management reward of the sharemilker will be discussed in a later sub-section.

In Section III it was pointed out that the financial data collected covers the period 1st April 1945 to the 31st March 1946, while the production figures apply to the dairy season 1945/46. This latter period ended either two or three months later, depending upon the company supplied, though in most cases it ended on the 30th May 1946. The management-reward figures consequently bear only an approximate, and not an absolute, relationship to the output of the farm. As the sample was drawn from a relatively small and uniform area (see map 1), the relationship of the two should tend to be similar in most cases.

(a) Management-reward per farm in relation to total output of B.F. (000 lbs.)

The advantage to the farm owner of large scale share farming is illustrated in graph 21.. opposite p .59. in which the returns to management per farm are shown to vary directly with the size of the B.F. output. That there are irregularities in the graph can be attributed to the small number of items in some of the class intervals. This graph, No. 21. illustrates quite strongly that:-

(a) On share-milking farms the B.F. production needs to be greater than a certain minimum level before all the owner's costs, other than management, are met.

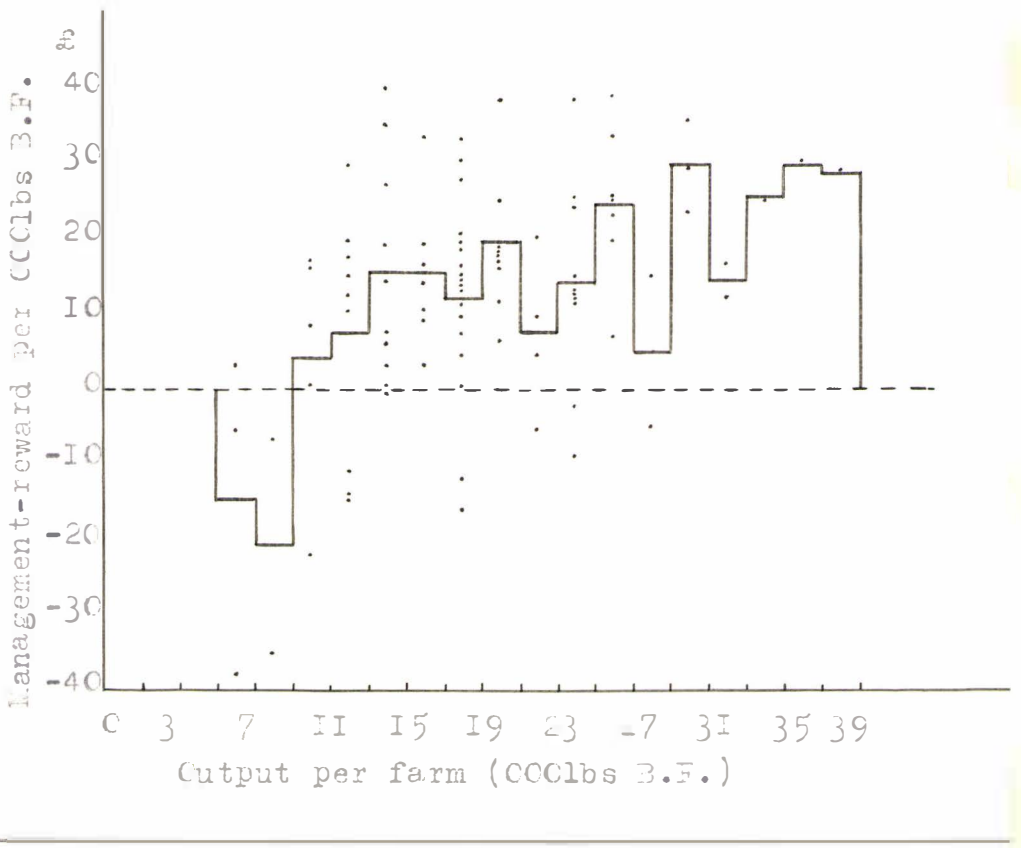
(b) Production needs to be greater still if a reasonable management-reward is to be expected.

On the farms surveyed, the minimum production that gave any management-reward fell somewhere in the 9,000 lbs. to 10,999 lbs. class. The minimum production that gave a management-reward at all commensurate with the size of the enterprise fell some-

Graph No 22

The farm-owner's management -reward per CCOlbs B.F. in relation to the size of the total butterfat output.

Plotted in each class interval are the items making up the class average.



where in the 11,000 lbs. to 12,999 lbs. class. It must be borne in mind, however, that production on these farms was down to approximately 15% below the average (see Section III). Furthermore this decline in production would not, in the case of the farm owner be accompanied by a similar decline in costs of production. The farm owner's costs are largely the fixed costs of interest, capital depreciation and capital maintenance. The size of the minimum economic holding in 000 lbs. B.F. can therefore be regarded as being slightly smaller than the above figures would indicate. The minimum economic unit can, however, only be kept down to this size if the output per labour unit exceeds the guaranteed price standards by the considerable amount that it does. If production was to fall until the output per full time labour equivalent was only 6,000 lbs. B.F. instead of 8,900, it is probable that the minimum economic unit would be somewhat over 12,000 lbs. or 13,000 lbs. B.F. This would apply to both 1/3 share and 1/2 share farms as it has been shown that the management reward does not differ significantly between the contract groups.

(b) Management-reward per 000 lbs. B.F. in relation to total output (000 lbs.)

Not only does the farm owner's management reward per farm increase with an increase in output, but, as is shown by graph .22. opp. p 51.. his management-reward per thousand lbs. of B.F. increases also. Unlike the total management-reward graph, however, the per thousand lbs. B.F. management-reward graph appears to level off gradually until at about 30,000 lbs. output there are apparently no further definite economies of scale to be gained.

This graph, No. 22. , would tend to indicate that the increased income of the large scale farm owner is largely due to a lowering of costs per 000 lbs. B.F. as output increases. The explanation of this is to be found in the division of costs between the farm owner and the sharemilker. The farm owner has to meet principally the capital charges on the farm and these do not tend to increase directly with the size of the total output. Consequently an increased scale of output is reflected in lower costs per 000 lbs. B.F. or, conversely, in higher management-reward per 000 lbs. B.F. If the farm owner's costs were all fixed costs, it would be expected that the rate of increase of the management reward per 000 lbs. B.F. would tend to decline slowly, but only after a certain output had been reached. Under these circumstances the management reward per farm would tend to increase more rapidly than is shown in graph .21., and the graph

would have a concave shape. (Evidence in favour of this is to be found in the Report of the Dairy Industry Commission, 1934, p.144). That the curve is not concave is due, it is suggested, to the inclusion of the variable costs of the 1/4 and 1/3 share farm owners in the same graph as the 1/2 share farm owners. If a sample, large enough to be divided into the three contract groups could be collected, it is suggested that the management reward per farm of the owner on the 1/2 share farms would increase more rapidly with each class interval than on the 1/3 share farms. This in turn, would be expected to increase at a greater rate,and to level off at a higher production, than the 1/4 share farms.

EFFECT OF THE DATE OF PURCHASE ON THE MANAGEMENT REWARD

In the previous sub-section the point was brought out that the farm owner's costs were primarily the fixed costs of capital depreciation, maintenance, and interest. The management-reward, it was thought, therefore, would be inversely proportional to the amount of capital invested. Furthermore, in Section III it was pointed out that the capital invested up to the time of the survey was significantly correlated with the date of purchase, when that date was classified by the average B.F. payout for that particular year.

In order to find the relationship between the management-reward and the B.F. payout, and hence the date of purchase and the capital investment, at the time of purchase, the management reward was first added to the original deduction of interest on equity capital. The whole sum was then expressed at an interest return on equity capital, and then plotted against the payout at the date of purchase. When the coefficient of correlation, r, between the two groups was worked out, the results were non-significant. Thus, despite there being some apparent tendency for the "interest return on capital" to be inversely proportional to the B.F. payout, r was only $-.015 \pm .002$

The average rate of interest return, thus calculated, on capital was 7.5%. This figure, however, is not absolutely correct for as was indicated in Section III, the capital investment figure included reinvested depreciation funds. This would tend to lower the interest rate somewhat below its correct percentage. Included in this interest return, however, is the undeducted management charge against the farm, (not the management-reward but the true charge for managerial supervision). Therefore in this respect the interest rate is too high. If this charge (App.IV) is first deducted it is probable that, allowing for the high capital investment figure, the rate of interest on equity capital would be approximately 5½% to 6%.

SOME FACTORS AFFECTING THE SHARE-MILKER'S MANAGEMENT REWARD

EFFECT OF TYPE OF CONTRACT AND SUPPLY

The principal difference between the tenure of 1/3 and 1/2 share-milkers is that the latter have capital invested in the farm and have to meet the costs associated with that capital. In addition, the 1/2 sharemilker is, because his tenure more closely approaches that of leasehold, required to exercise more managerial supervision than the 1/3 sharemilker. This latter point will not affect the management reward, as previously defined, though it will considerably influence the proportions of the management charge and pure profit, making up the management reward. (App.IV).

For his extra costs and duties, the 1/2 share-milker receives an extra 13⅓% of the receipts from the sale of B.F. That this extra sum is sufficient to meet these extra costs is indicated by analysis of variance (Table 36) of the average management rewards of the various groups. (Table 35).

Table 35. Average Management-reward per 000 lbs. B.F. (sharemilker)

Contract	Butter	Cheese	Dried Milk	Means
	£	£	£	£
1/4 share	10.3	12.9	-	10.9
1/3 share	12.2	14.2	12.5	12.9
1/2 share	9.3	12.4	8.2	9.8
Means	10.8	13.5	10.3	N = 84

The apparent advantage of the 1/3 sharemilkers in Table 35 above is shown, as follows, to be significant only at the 20% level.

Table 36. Sub-class Analysis of Variance. Management-reward of 1/2 and 1/3 Share-milkers (all supplies included) per 000 lbs. B.F.

Means of the Sub-classes.

Contract	Butter	Cheese	Dried Milk	Means
	£	£	£	£
1/3 share	12.2	14.2	12.5	13.0
1/2 share	9.3	12.4	8.2	10.0
Means	10.6	13.3	10.4	N = 80

Analysis of the Sub-classes.

Source of Variance	d.f.	S.S.	M.S.	F.	Sign
Sub-classes	5	25.32			
Between Contract	1	13.51	13.51	1.95	N.S.*
Between Supply	2	10.25	5.13		N.S.
Interaction	2	1.56	0.78		N.S.
Error	77		6.91		

* Significant at the 20% level only.

When all the items are included, and the groups are not sub-classed as above, but merely separated out into the three contract or the three supply groups, the value of F in each case is not significant. (Not even at the 20% level). (Table37,38)

Table 37. Analysis of Variance. The Three Contract Groups.

Source of Variance	d.f.	S.S.	M.S.	F.	Sign
Total	83	5,856.49			
Between Group	2	195.43	97.72	1.39	N.S.
Within Group	81	5,661.06	69.88		

Table 38. Analysis of Variance. The Three Supply Groups.

Source of Variance	d.f.	S.S.	M.S.	F.	Sign
Total	83	5,856.49			
Between Group	2	147.48	73.74	1.04	N.S.
Within Group	81	5,709.01	70.48		

It would appear, therefore, that, as in the case of the farm owner groups, the type of contract has a non-significant influence on the share-milker's management-reward per 000 lbs. B.F. It is suggested, however, that if the comparison had been made on the basis of the pure profit (App.IV), the differential deductions would have caused a significant difference between the groups. Similarly the effect of the type of supply is apparently, in the case of share-milkers, non-significant.

If the sub-section dealing with the effect of the contract and supply on the farm owner's income is compared with the present sub-section, it will be noted that in the former the between supply variance is significant at the 20% level.

Furthermore, the between contract variance is not significant even at the 20% level. This is the reverse of the present sub-section. It appears reasonable to conclude, therefore, that neither in the case of the farm owner nor the share-milker was the average management reward significantly affected by the type of contract or the type of supply. If this be so, the indication is that the margins between the 1/2 and 1/3 sharemilkers and between the 1/3 and 1/2 share farm owners were, in the season covered, sufficient to compensate each party for the different costs involved. That is, there was apparently no relative advantage, per 000 lbs. B.F., in adopting one or other of the two contracts. Whether or not the results would have been the same had the comparisons been made on the basis of the pure profit (App.IV), is not discernable by the present method of analysis. It is suggested, however, that, had the latter course been adopted, the 1/2 share farm owner would have been at a relative advantage as compared with the 1/3 share farm owner. Furthermore, the 1/3 share milker would have been at a relative advantage as compared with the 1/2 sharemilker. (App.IV). The effect of the recent Arbitration Court alteration to the 1/3 share agreement, and the effect of this alteration on the margin between 1/3 and 1/2 share receipts, will be discussed in Section VII.

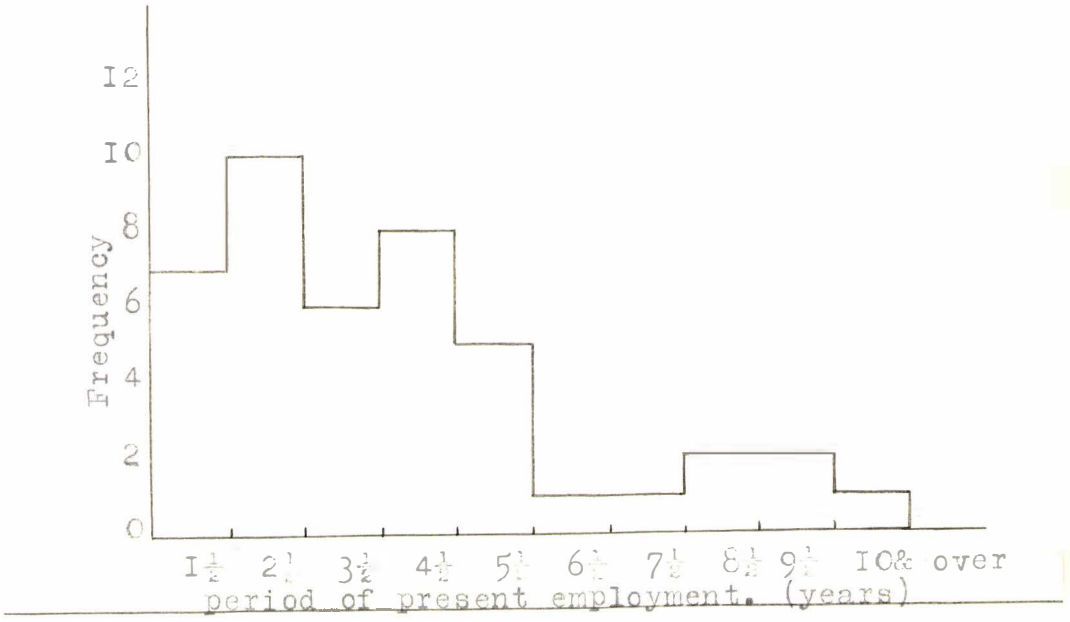
EFFECT OF LENGTH OF OCCUPANCY

The first years, and especially the first year, of occupancy of a farm and management of a herd can generally be regarded as being less profitable than those coming after secure establishment.

In order to find whether or not this generalisation was applicable to share-milkers, the sharemilkers of each of the two main contract groups were classified according to their length of occupancy on the farm visited. The classes into which the sharemilkers were grouped were five in number and included, at one end, those who had been on the farm for five or more years. At the other extreme, were those who had been on the farm only since the start of the season 1944/45. The average management-reward of each class is tabulated in Table 39. It should be noted, however, that this table and this whole survey excludes many of the annual migrants because they would have arrived on the farm only a few months prior to the period covered by the survey.

Graph No 23a

Length of time that the share-milker has been employed on the farm surveyed.
(Half share-milkers)



Graph No 23b

Length of time that the share-milker has been employed on the farm surveyed.
(Third share-milkers)

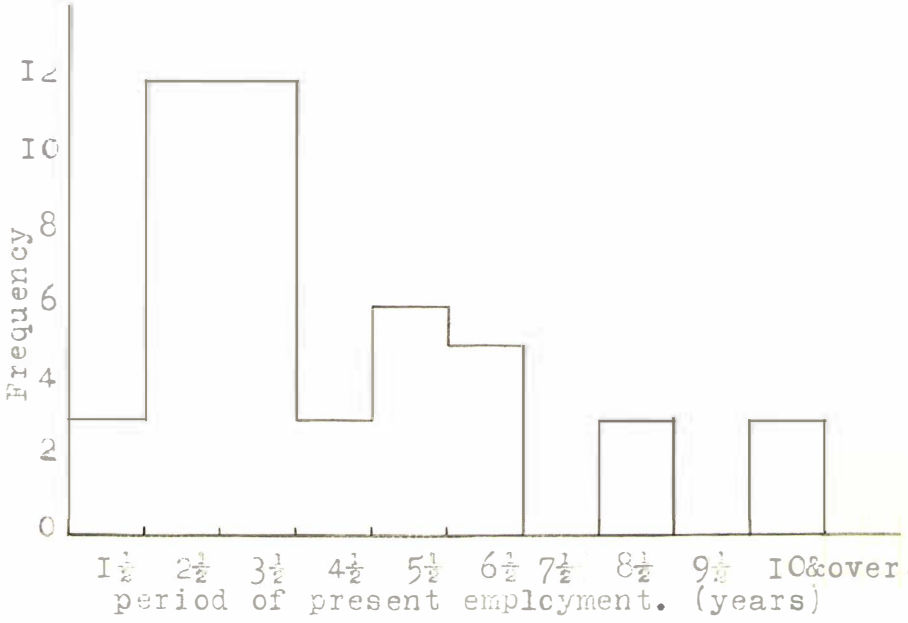


Table 39. Average Management-reward per Farm according to the Period of Occupancy. (Sharemilker).

Length of occupancy in years	1	2	3	4	5
Average management-reward (£) 1/3 share milkers	262	314	263	258	268
Average management-reward (£) 1/2 share-milkers	118	131	214	160	152

When the 1/2 share classes, the means of which appear to have a general increase were subjected to an analysis of variance, the results were non-significant (Table 40)

Table 40. Analysis of Variance. Management-reward per farm of the 1/2 share-milker in relation to length of occupancy.

Source of Variance	d.f.	S.S.	M.S.	F.	Sign
Total	42	691,611			
Between Group	4	36,291	9,075	-	N.S.
Within Group	38	655,320	17,245		

Because the means of the 1/3 share classes, with the exception of one class, fell within a range of £10, no analysis was carried out on this contract. Examination of the crude data was sufficient to show that the within group variation would outweigh any between group variation. The apparent lack of relationship between the sharemilker's management-reward and his length of occupancy is probably due to the fact that, unlike a new owner manager, a new sharemilker comes on to a farm on which there has been little change of management. It is very rarely that both the farm owner and the sharemilker change farms simultaneously. Furthermore, in many cases, the 1/2 sharemilker brings his own herd, with which he is familiar, with him to the new farm. Both of these considerations are such as to reduce the difference between the effects of short and long periods of occupancy.

Graphs No. 23a and 23b show that, of the 47 1/3 sharemilkers supplying this data, 24, or just over half, had been on the farm either two or three years. A further three had been on the farm for only one year. Similarly, of the 43 1/2 sharemilkers included in this sub-section, 23, or just over half, had been on the farm for three or fewer years. All but seven of them had been in occupation for fewer than six years.

The general tendency for the occupancy of share-milkers to be of a short term type may, however, affect the farm owner and the sharemilker in ways not indicated by this section's analysis. It may result in a lowered standard of maintenance. This re-acts to the detriment of the farm owner more than to that of the sharemilker, because, while the cost of any neglected work is legally recoverable from the sharemilker (App.II), it is rarely collected. The work in most cases is done at the end of the season at the farm owner's expense. It is not, however, fair to attribute to the sharemilker all the responsibility for short term tenures. The impression gained during the survey was that while many sharemilkers shift from farm to farm voluntary, there are also farm owners who make a practice of changing the sharemilker at short intervals. Their contention is that "a new broom sweeps clean". If this be so, the evidence, up to the present time, is lacking.

Not only may the effect of short tenure be registered in lowered maintenance standards, but the stability of the "industry" may be undermined. The effect of frequent changes of farms upon the schooling received by the children and upon their family life is evidence enough. Furthermore, the sharemilker's chances of getting to be a farm owner himself are reduced. The nett effect is the establishment of a migratory and unstable "sharemilking class". It matters not who is responsible for the short tenure occupancy. What does matter is that there be a move away from it, for in its present form it cannot be condemned strongly enough.

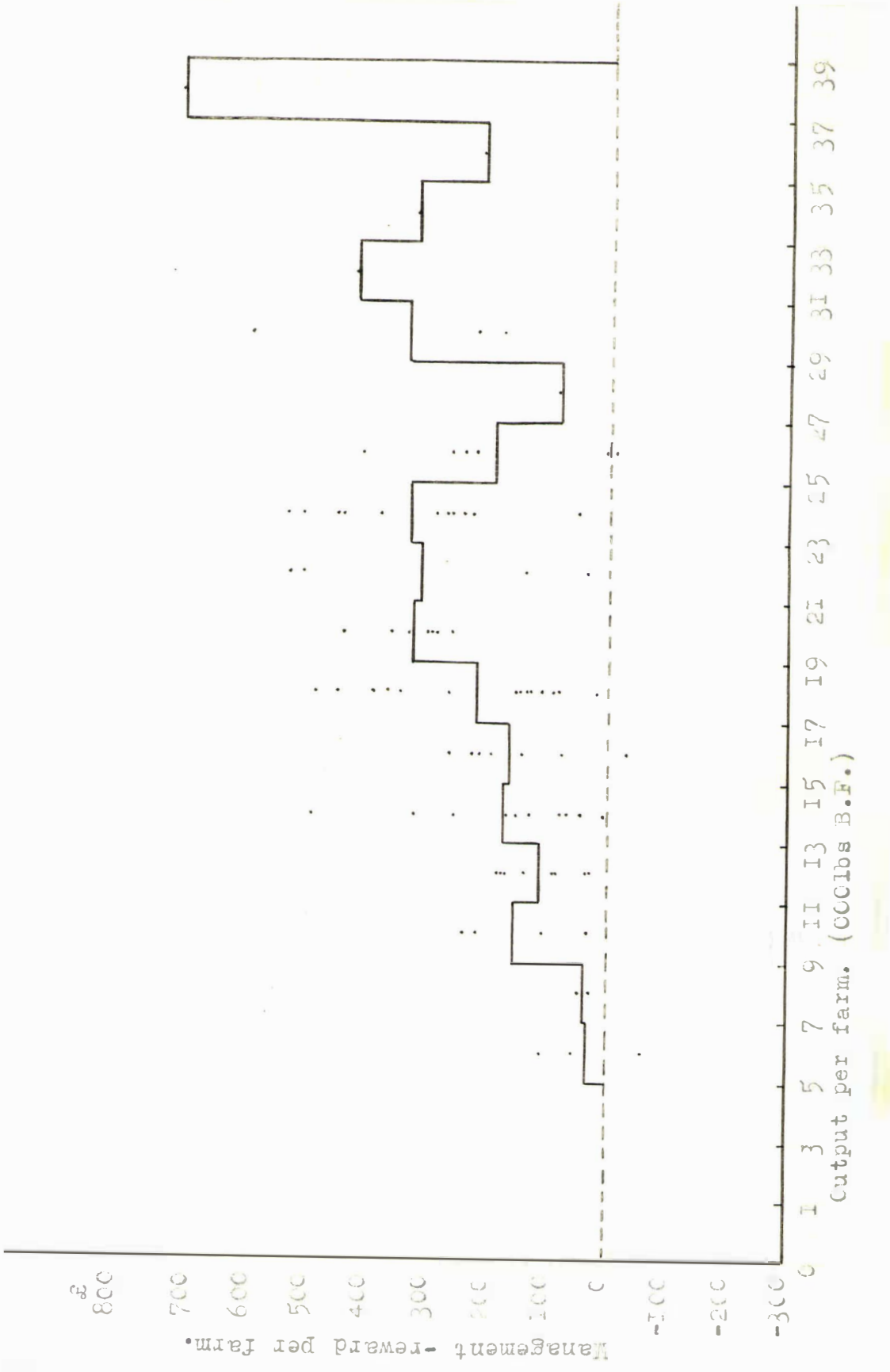
EFFECT OF THE SIZE OF THE FARM ON THE SHAREMILKER'S MANAGEMENT REWARD

The majority of the production costs for which the sharemilker is responsible are, unlike those of the farm owner, variable costs. They comprise principally labour, shed and in the case of 1/2 sharemilkers, certain capital costs associated with the maintenance of the herd. There is, however, one important fixed cost, and that is the charge against the sharemilker's own labour. This has been put in at £273 in each case. It is to be expected, therefore, that the effect of the size of the farm mentioned in terms of total output on the management reward of the sharemilker, will be somewhat different from the effect on the farm owner's reward. In the farm owner's sub-section, the diseconomies of small scale production, were shown to be due to a disproportionate capital investment and often to extra labour costs. The sharemilker's share of the gross receipts is

Graph No 24.

Share-milker's management-reward per farm in relation to the size of the total butterfat production.

Plotted in each class interval are the items making up the class average.



principally a labour reward. This applies even in the case of the 1/2 share-milker. If, therefore, capital costs are raised over the amount allowed for, the amount left for the management reward is diminished. This, however, is not as serious as the effects of excessive labour utilisation, for it is possible for the share-milker to be some 000 lbs. B.F. behind the guaranteed price calculations. On a 12,000 lbs. B.F. production farm, e.g. the guaranteed price allows for the full time employment of two labour units or its equivalent in part time labour. On this size share-milking farm, the sharemilker receives the income from only 6,000 lbs. B.F. for the payment of labour and other costs. Hence, if the production per labour unit was only 6,000 lbs. B.F. (which is only sufficient to pay the two full time labour units plus a very small remainder), the sharemilker would lose financially to the extent of his other costs. This situation would be accentuated on 1/3 share farms. It was rarely found, however, that it took two full time labour equivalents to produce 12,000 lbs. B.F. (or three, 18,000 lbs. etc.) as, in most cases, the output per full time labour unit was considerably higher than 6,000 lbs. B.F. (Section IV). The higher the output per full time labour equivalent, the less pressing became the labour costs. On small farms, however, there is a maximum output that can be gained per full time labour equivalent. This maximum is limited not by the labour available, but by the size of the farm. It is on these farms that the problem of meeting all costs becomes serious. It is these farms which show the greatest diseconomies of scale, because the minimum labour charge is £273. In Graphs 24. and 25. are shown the effects of the total output on the management reward per farm and per 000 lbs. B.F. respectively. These graphs, the same as graphs 21. and 22. should be read in the light of the fact that the total production figures apply to a slightly different period from the management reward figures.

(a) Management-reward per farm in relation to the total output of B.F. (000 lbs)

Like the graph of the farm owner's management reward, that of the sharemilker's increases considerably with increases in the total output. The graph of this management reward, however, differs from the farm owner's in two respects:-

(a) Instead of increasing directly with the output, it tends to increase by smaller increments in each class over the 19,000 lbs. B.F. output. Prior to this output the increase is rapid and more or less directly proportional to output increases.

(b) At no output, not even in the 5,000 lbs. to 6,999 lbs. class, does the class average management reward of the sharemilker fail to be positive. this may be due, however, to the inclusion of one or two very good farms in this output range.

The management rewards below the 9,000 lbs. to 10,999 lbs. class are, however, too small to provide a management income at all commensurate with the duties involved (App.IV). Each of these characteristics of the management-reward can be attributed to the type of production costs paid by the sharemilker. In the main, they are variable costs and can be adjusted,within limits, to a scale of production. This would account for the apparent solvency of even the smallest output classes. The costs do, however, include the large fixed cost item of the share-milker's own labour and, in some cases, the relatively fixed or stable costs of capital maintenance. The influence of these is such as to cause considerable diseconomies with small scale production. The management-reward therefore, increases rapidly with increases in production up to about 19,000 lbs. B.F. Above that level of production the large variable costs of labour apparently tends to reduce any economy of scale. The graph, as a result, tends to flatten out. Nevertheless, caution is necessary in interpreting this graph as there is a definite paucity of items in the higher classes.

(b) Management-reward per 000 lbs. B.F. in relation to total output (000 lbs.)

As would be expected from the above, it is very difficult to detect any significant increase in the management-reward per 000 lbs. B.F. when the total output increases. The graph, 25. , of the management-reward per 000 lbs. B.F. shows some slight increase over the output range 5,000 lbs. to 20,999 lbs. B.F., but this is not nearly so marked as the increase in the corresponding farm owner graph. For outputs above the 19,000 to 20,999 lbs. class, there is apparently no increase in the management reward per 000 lbs. B.F. The management reward per 000 lbs. B.F. may not increase beyond this output range, but as it is a positive amount it does mean that the sharemilker who is responsible for the work of a larger output does get an increasing absolute amount of management reward. Below 19,000 lbs. B.F. an increase of output means both more management reward per 000 lbs. and more units of 000 lbs. so that the management reward is increasing at a faster proportionate rate than is output itself.

If all the costs were truly variable the management per 000 lbs. B.F. would be no greater for an output of 30,000 lbs. than for one of 6,000 lbs. That the management reward is greater at the higher output levels is due to the combination of 1/2, 1/3 and 1/4 shares in the one graph. Secondly, it is due to the lowering of the fixed costs, such as the sharemilker's own labour, per 000 lbs. B.F. as output increases. It is probable that, while increasing returns due to the fixed costs are being gained all the time, diminishing returns due to the variable costs set in at about the 9,000 lbs. output level. At this stage the first full time labour unit, the large fixed cost of the sharemilker's labour will be fully occupied. Added labour cost will, after this, probably cause the economies of the fixed cost to ~~the~~ be opposed by diseconomies due to the variable costs over the output range of 9,000 lbs. to 20,999 lbs. B.F. At the latter point they appear to be equal in effect on the management reward. Above the output of about 20,000 lbs. to 21,000 lbs decreasing returns (or increasing costs of the variable factors) appear to be a more important influence on the management reward per farm than do increasing returns, (or decreasing costs of the fixed factors). The nett effect is that the management reward per farm increases at a slower rate per class interval increase in total production.

EFFECT OF THE SIZE OF THE SHARE-MILKER'S FAMILY ON HIS MANAGEMENT REWARD

A comparison between groups of sharemilkers, which is based on their management reward, is a comparison of incomes after several costs, which are not normally paid out costs, have been deducted. In actual practice a share-milking family for its labour and capital invested, an income considerably higher than that indicated by the preceeding analyses. The earnings of the family, as a working unit, include the wages received for their own labour, plus interest on any capital invested, in addition to that income which has been styled the management reward. Hence, if two sharemilkers receive the same management-reward, the sharemilker with the larger family and/or the larger capital investment will receive the larger family income.

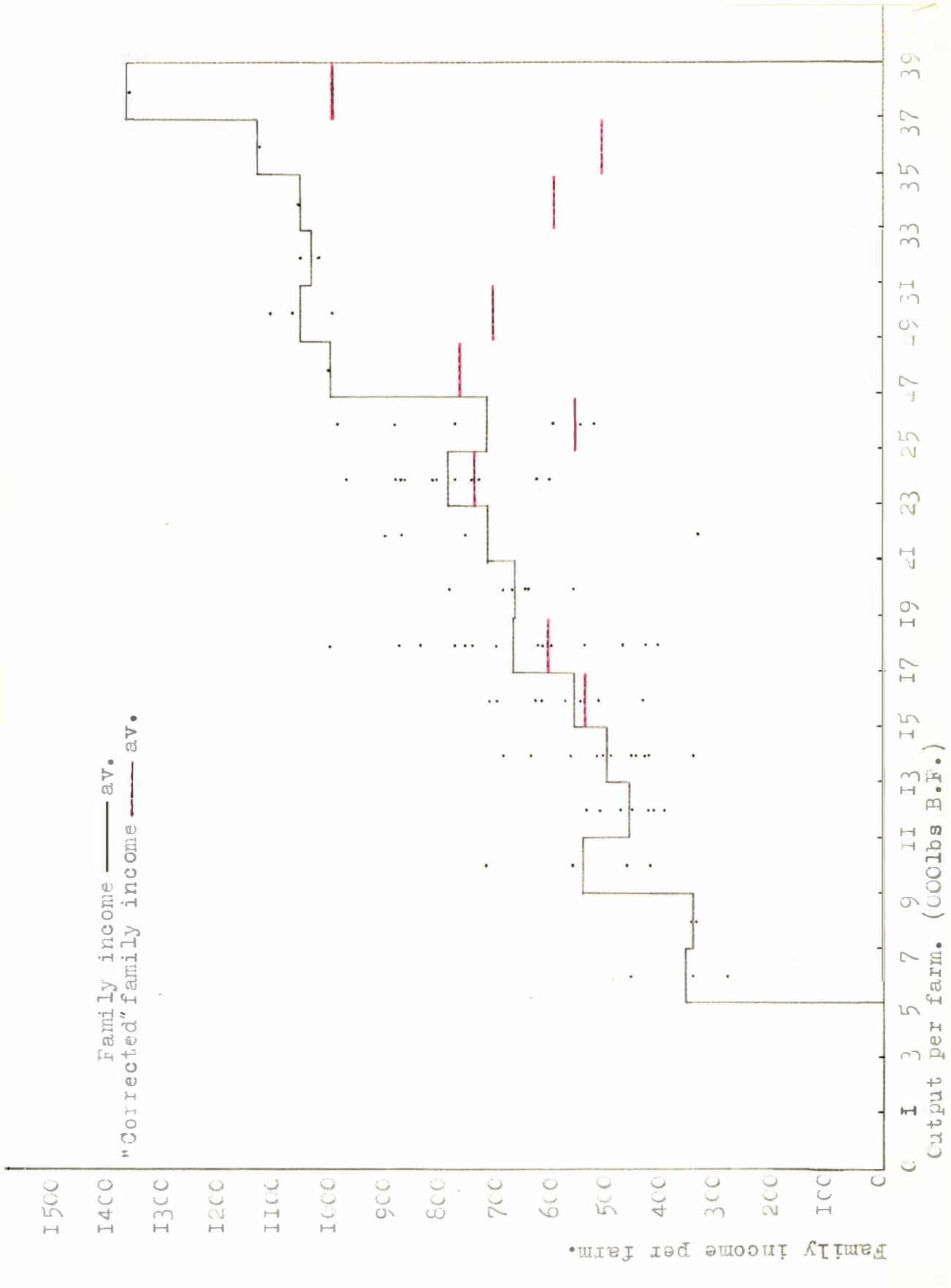
During the survey, data was collected concerning the capital investment, the family labour employed on the farm, and the payment, if any, that was made for that labour. Family labour was, furthermore, divided into over 16 and under 16 years of age groups. The latter group was defined as family help and the former

Graph No 26

Share-milker's "family income" in relation to the size of the total butterfat output.

Plotted in the relevant class intervals on the same graph is the "corrected family income".

The individual items in each class interval refer to the "family income' and not tc the "corrected family income"



as real wage earners. No data was collected concerning those over 21 or under 21 years of age. In graph 26.. the members of the family, other than the wife, over sixteen years of age, have been classified as wage earners and hence as non-family labour. They are merely employees who happened to be members of the family. On the same graph, however, is plotted the income accruing to all the members of the sharemilker's family. The heavy line graph applies to the sharemilker, his wife and all other immediate family labour irrespective of its age. It represents the earnings of labour other than the non-family employees and other than the farm owner's labour earnings.

The earnings per farm of this family group are very often more than £273 greater than the sharemilker's management reward and, furthermore, increased directly with any increase in the scale of production. These earnings represent the maximum rate (if taxes, living expenses etc. are deducted) at which the sharemilker and the members of his family could accumulate capital if they all desired to invest, say, in a farm. If the average earnings of the family members, other than the wife, over sixteen years of age, are deducted from each class, the balance represents the corrected family income. This income is indicated by the dotted lines through the class intervals in the cases where there were "family employees" over sixteen years of age. In the remaining class intervals the corrected family income is the same as the income for all the members of the family. The corrected family income curve, unlike the heavy line curve, while representing a greater income than the management reward curve, tends to follow the same shape as the management reward curve. If the scarcity of items in the higher output classes is borne in mind, the graph appears to indicate that after about the 23,000 lbs. to 24,999 lbs. B.F. output is reached, the family per farm shows very little, if any, increase. That is, above this output some of the family labour is earning less than its transfer earnings. It is quite probable, however, that this finding is in error, because of the scarcity of items in each of the higher output classes.

It does appear clear, however, that:-

(a) The family income is considerably greater than £273 above the sharemilker's management reward. This is due to the intensive use of family labour on sharemilking farms.

(b) The larger family on the larger farm receives generally, a higher income per farm than the small family on the small farm. They may not, however, earn a greater income per family member. The larger income is due, no doubt, to the economies of labour utilisation on the larger farms. Other writers, especially Hamilton and The Dairy Industry Commission, refer to the higher output per labour unit, and consequently the greater efficiency of labour on larger size farms.

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PART III.

GENERAL

PART III

SECTION VI

(a) A Comparison of Share-milking farms with Owner-manager farms:

In this comparison of the share-milking farms surveyed with owner-manager farms, attention has been confined to a limited number of general characteristics. Furthermore, the attempt has been made to confine the comparison in as many instances as possible, to the area under survey. Where this was not possible the comparison was confined to farms situated in the Auckland land district. The confining of the comparison to a relatively restricted area, however, introduces an error into the results. The error is due to the inclusion, by those who compile the Agricultural and Pastoral statistics, of share-milking and tenant farm data in the same averages and summaries as owner-manager farms.

The comparison is therefore really between a sample of share-milking farms and a population made up of owner-manager, tenant and share-milking farms. The degree of error in this comparison is directly proportional to the importance of tenant and share-milking farms in the Auckland, especially the Waikato, area. If the error, however, is accepted, the data in this section does place the share-milking farm sample in relief against a background of the population from which it was drawn.

Table A: Comparison of Share-milking farms with Owner-manager farms:

Variable	Source of Information				
	S/M farms Present Survey	Owner-manager farms			
		Doig (3)	Govt.Stat. (2)	N.Z.D.B. (17)	Dairy Industry Comm. (13)
Effective herd size	90.0	58.8	-	53.8	64.6
Effective area (acres)	137.6	105.53	91	-	*117.9
Cows per 100 acres	65.9	-	-	-	* 54.1
Production per cow(lbs)	206.7	-	-	190.5	-
Production per farm(lbs)	18,713	-	-	10,250	-

* It is not indicated whether this refers to the effective or the total area.

The date relating to herd size, production per cow and per farm, has been

derived from information supplied by the New Zealand Dairy Board (17). This Board provided the data upon receipt of the necessary authorisation from the Dairy Companies situated in the area of the survey. They have not been named as it was their desire to remain anonymous.

Herd Size:

In Section III it was shown that the mean effective size of the 126 herds in the sample surveyed was 90 cows. The average effective size of the 5066 herds (17) located in the area of the present survey was, for the season under review, 53.8 cows. This corresponds very closely to the average herd size of Doig's sample (3) of 413 herds. The average size in this case was 58.8 cows. Figures compiled by the Department of Agriculture for the Dairy Industry Commission in 1934 (13) indicate that there is some range about these means. The Commission's data (13), when classified by locality, is as follows:

Northern Waikato	48.0 cows
Mid Waikato	63.6 cows
East Waikato	81.7 cows

Weighted mean 64.6 cows.

Whichever set of data is used for the comparison, the difference in herd size between the share-milking farms of the present survey and other dairy farms is quite considerable.

Farm Area:

The mean effective area of the share-milking farms surveyed was 137.6 acres. It was not possible to get the average effective area of all the farms in the locality under survey, but some comparative data has been drawn from Doig (3), the Gov't. Statistician (2) and the Report of the Dairy Industry Commission (13).

The average total area of Doig's (3) sample was 130.48 acres and the average effective area was 105.53 acres. The average area devoted to dairying on the 19,307 farms surveyed by the Gov't Statistician (2) was 91 acres. The average area of the farms surveyed for the Dairy Industry Commission (13) was, by locality, as follows:

Northern Waikato	99.2 acres
Mid Waikato	120.4 acres
East Waikato	132.8 acres

Weighted mean, 117.9 acres.

This latter set of data, however, may refer to either the average total area or the average effective area. It is not stated to which it applies in Table 20E (13). If the figures apply to the average total area, then the difference in area between share-milking farms and other dairy farms will be even more marked.

Cows Carried per 100 acres:

The cows carried per 100 acres on the share-milking farms surveyed were 61, 64 and 68 for the 1/4, 1/3 and 1/2 share groups respectively (Table 4). The cows carried per 100 acres on the 550 farms supplying data to the Dairy Industry Commission (13) were as follows:

Northern Waikato	48.3 cows
Mid Waikato	52.8 cows
East Waikato	61.5 cows

Weighted mean, 54.1 cows.

It is probable, however, that these figures refer to the number of cows carried per total 100 acres and not per effective 100 acres. If this is so, then the disparity between the two sets of figures should not be as great as shown in this section.

Production per Cow:

The average production per cow for the farms under survey was 206.7 lbs. This was somewhat higher than the production in the same season on the sample of 5066 dairy farms (17) located in the same area. The average effective production per cow on these farms was 190.5 lbs. of butterfat. Whether or not the means are significantly different is indeterminable as no individual farm data was supplied for the 5066 farm sample. It is probable, however, that, as the samples are large, the difference will be significant. The New Zealand Dairy Board, in the Report for the 1945/46 season, estimated that the average effective production per cow in the North Island was 190.6 lbs. B.F., and that for the Dominion it was 186 lbs.

Production per Farm:

Corresponding with the larger herd size on share-milking farms, as compared with other dairy farms, is the much greater average production of butterfat per farm. On the share-milking farm sample the mean output of butterfat was 18,713 lbs. On the sample of 5066 dairy farms in the same area (17) the mean

output was 10,250 lbs.

Effect of the autumn drought in 1946:

Both the per cow and per farm output figures above refer to the same period and to approximately the same locality. It can be expected, therefore, that the effect of the drought will have been similar in both samples. If this is so, it would appear that the total butterfat production on share-milking farms is nearly double that of other dairy farms. The per cow production, however, while probably being significantly higher, does not appear to be markedly different.

(b) A Comparison of New Zealand Share-milking tenancies with overseas share tenancies:

There are three main differences between share-farming in New Zealand and share-farming in overseas countries. Each of these differences reflects to the advantage of the New Zealand system.

Firstly, in New Zealand, as in Australia, share-farming is confined to dairy farming. In Europe and on the North American Continent it is found in association with both cropping and diversified farming, as well as with dairying. As a result of being confined to a grassland system of farming, share-farming in New Zealand does not suffer from the great risk of soil fertility depletion common to many overseas share tenancies. The depletion of the fixed assets on New Zealand farms is, therefore, much less marked, even with short tenancies, than in the principal overseas share groups.

Secondly, the tendency overseas, and in the U.S.A. in particular, is for share-farming to be associated with the poorer soil fertility areas (18,19). In New Zealand, on the other hand, share-farming (milking) is found on land that is just as fertile and just as valuable as that farmed by any other tenure group.

Thirdly, in the U.S.A. and Europe, share-farming is found in association with units that tend towards the small size (19). In New Zealand, however, the reverse is the case.

The second and third of these differences are the most important in the short run. The first one will, however, exert just as important an effect in the long run.

Share farming, apart from Australasia, is found in France, Italy, Portugal, the Danubian States, the U.S.A. and parts of the Far East. Of these countries

France and the United States have provided most of the subject material for published works. In the U.S.A. share tenancy was, in 1920 (20), more common than cash tenancy. There were at that time 1,806,634 tenants who paid their rental either wholly or partly in the form of a share of the produce or proceeds therefrom. There were only 585,005 tenants who, at that time, paid a fixed cash rental. By 1935 the number of tenant farmers had increased to 2,865,155, or to 42 percent of the total number of farm families (24). The number of share tenants has likewise increased. The four common systems of share-farming in the U.S.A. (20), when the classification is based upon the share received by the landlord, are as follows:

(a) The one-fourth system: This is found on the Western edge of the wheat region.

(b) The one-third system: This system is very common throughout the U.S.A., with the exception of the high land value regions of the North Central States.

(c) The two-fifths system: In the Corn Belt the 2/5 system has been an intermediate stage in the rise of share rents from a third to half of the crop.

(d) The half-share system: This is found in all parts of the U.S.A. It is the principal share tenancy of the cotton and tobacco regions of the South.

(e) The two-thirds system: This system is not very common in the United States. It is, however, the nearest approach to what is called the third-share system in New Zealand, for the landlord supplies everything but the labour for current operations.

In France the share or metayer system is, at best, stationary (19). It is, however, the opinion that the system has resulted in improved agricultural practices in the Departments where this form of tenure outnumbers ordinary leases. The division of the proceeds in this system has been well established by custom, even down to the minutest details. The most frequent length of tenancy granted to the metayer used to be one year, but it would appear that there is a tendency now for the period of occupancy to be six or even ten years. In the U.S.A., on the other hand, the average length of occupancy on all

tenant farms (share and cash) was four years in the 1920s (22).

Vogt (22) states that the increase in tenant farming, including share-farming, has been most marked in the U.S.A. since the middle of the last century. This, he states, has coincided with the passing of conditions that made it more desirable to take up new land rather than rent land already improved by others. That is, it has coincided with the period of steadily increasing land values. In New Zealand it would appear that the increase in share-milking has been most marked since the early 1920s. This period coincided with the complete occupation of the Waikato basin and with the steady increase in land values throughout New Zealand dairying districts. Furthermore, prior to 1920 there had been a period of steadily rising butterfat prices. This situation favoured the use of a small equity and large mortgage for the purchase of newly opened up areas - e.g. the Waikato. After 1920 this course, was, due to the lowered butterfat prices, not so easy to adopt. As a consequence pressure was directed towards a system of land tenure that would open up a new avenue to land ownership. Such an avenue was found in the adoption of tenancy and share-tenancy systems. In that respect share-milking in New Zealand has been similar in its use to share-farming overseas. That the system provides in overseas countries today, as well as in New Zealand, a much more restricted and difficult path to ownership (Sect. IV) is referred to by Howard (23). She states "... a system where financial responsibility is divided between the owner of the land and the tenant may, in certain respects, constitute a rung in the agricultural ladder.....But again with the close of the pioneer period in farming, such opportunities become rarer and share-farming tends to become a permanent position in which the share-farmer remains all his life without attaining ownership."

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S E C T I O N VII.

THE SHARE-MILKING AGREEMENT

THE DEVELOPMENT OF THE SHARE-MILKING AGREEMENT

In the introductory Section it was mentioned that share-milking apparently originated in New Zealand towards the close of the last century. From what can be discovered from sources other than published works, it appears that about the turn of the century the share-milker as a rule received twentyfive percent of the butterfat cheque and the same proportion of the by-product receipts. For this he did all the maintenance work of the farm and was also expected to do some developmental work. This latter stipulation was not confined to New Zealand for Vogt has mentioned (22) that in some cases tenants and share-tenants in the United States were expected to aid in the development of the farms on which they were working.

Coincidental with the transfer of the main centre of share-milking to the Waikato about the time of the 1914-18 War, and with the start of "half" share-milking (p.2), there were two changes in the division of the gross receipts. Firstly, the share of the butterfat cheque was increased to one third. Secondly, the by-product share rose also to one third. As the agreements between the share-milker and the farm-owner were not subject to Statutory Regulation at this time, there were variations from farm to farm in the percentage share division. For example the share of the by-product receipts varied, as seen by inspection of old contracts, between one third and one half. During this period, and up to 1937, the nature of the agreement was governed by individual bargaining and by local custom.

In 1937, however, Legislation (25), which defined the minimum percentage of returns for share-milkers and the respective responsibilities of the farm owner and the share-milker, was passed in Parliament. This Act (25) ruled that the "quarter" share-milker was to receive not less than twentyfive percent of the dairy cheque other than share-holders bonus payments. The third share-milker was to receive not less than thirtythree and a third percent of the dairy cheque other than share bonus payments. In each case the share-milker was to receive half the proceeds from the sale of by-products including half the value of calves reared for herd replacements.

The provisions of this schedule of standard terms (25) were clarified and slightly amended by an Order (26) in 1939. A further Order (27) in 1941 made alterations in the procedure to be adopted if arbitration was resorted to. Neither of these Orders altered the percentage division of the returns or profits. By the Share-milking Agreements Order 1944 (28), however, the share to be received by the share-milker was increased from twentyfive percent and thirty-three and a third percent to twentyfive percent plus ten percent of twentyfive percent, and to thirtythree and a third percent plus ten percent of thirtythree and a third percent on "quarter" and "third" share-farms respectively. That is the shares now stood at twentyseven and a half percent and thirtysix and two thirds percent. Suchwas the situation at the time to which the data collected on this survey applies. A copy of the Share-milking Agreements Order 1944 (28) is to be found in Appendix II.

Neither the Share-milking Agreements Act (25) nor any of its amending Orders has made any provision for half-share agreements other than to state that other classes of share-milking agreements may be brought within the scope of the Act "if at any time the Governor-General is satisfied .... that standard terms and conditions have been agreed to by representative organisations of employers and share-milkers....."

THE PRESENT FORM OF THE SHARE-MILKING AGREEMENT

As indicated by the copy of the Share-milking Agreements Order 1946 (29) in Appendix II, the present shares received by the sharemilkers are twentynine percent and thirtynine percent for "quarter" and "third" share agreements respectively. The clauses relating to the division of the proceeds from the sale of the by-products have remained unaltered. Furthermore, the "half" share agreement still remains outside the scope of the Share-milking Agreements Act (25). The Court of Arbitration, however, has recommended, as the result of evidence placed before it in 1946 (14), that the Minister of Labour take such steps as are necessary to have a standard "half" share agreement drawn up.

It was mentioned in the previous subsection that such an agreement can only be drawn up if both the employers' and the share-milkers' representatives agree upon the clauses. Up till May of 1947, however, the employers'

organisation had refused to meet the share-milkers' representatives on this subject. They contended that a standard agreement could not be applied to the half share contract. Therefore, unless the parties can be prevailed upon to come to conference or the Minister of Labour instructs them by an Order in Regulation to do so, the half share agreement will remain outside the scope of the Act (25).

SOME POSSIBLE FUTURE CHANGES IN SHARE-MILKING TENURES AND IN SHARE-MILKING AGREEMENTS.

The three topics considered under this heading are, firstly, the possible outcome of the recommendation that half-share agreements be brought within the scope of the Share-milking Agreements Act, 1937. Secondly, an already evident effect and some possible future effects of the decision to raise the "third" share-milker's share to thirtynine percent. Thirdly, a tentatively suggested agreement that might overcome some of the effects arising out of the second topic and out of the small size of farm on which share-milking is sometimes found.

It would appear that there is a decided possibility that the "half" share agreement will be brought within the scope of the Act (25), despite the opposition of the employers' organisation. Furthermore, it would appear that there is a likelihood of the share-milker's share being set at sixty percent and not fifty percent. The argument put forward in favour of increasing the share to sixty percent appears to be that as the "third" share has been raised to thirtynine percent, it is only fair to raise the "half" share somewhat in order to bring the two agreements into line. It is suggested, however, on the basis of the present survey (Section V), that an increase of ten percent would be considerably more than sufficient to compensate the "half" share-milker for any increases given to the "third" share-milker. On the "half" share-farms surveyed some three or four share-milkers received either fiftytwo and a half percent, fiftyfive percent or sixty percent of the dairy cheque. (This was not mentioned in the appropriate section, nor was it stated that in these circumstances the income figures of both the farm-owner and the share-milker have, for analysis purposes, been converted to a fifty percent share.) On three other half share farms, however, the share-milker was not permitted to rear replacement stock on the farm. On these farms the share-milkers were definitely at a disadvantage as compared with third share-milkers, and they

would undoubtedly benefit from any Regulations that made a reasonable allowance for stock replacements.

The immediate effects of raising the third share-milker's percentage receipts to thirtynine percent were twofold. On the one hand there was a swing over to "quarter" share-milking by some farm-owners. They contended, and this view was also held by their Organisation, that the ten percent difference between twentynine percent and thirtynine percent was more than sufficient to cover the extra maintenance costs associated with "quarter" share-milking. This applied particularly to the farms on which the farm-owner was able and willing to do some of the maintenance work himself. The other effect was a reduction in the number of farms on which share-milking was practised. The extent to which the numbers were reduced was not accurately ascertainable on the survey but it would appear that there has been some swing over to the employment of wage labour and to labour hired on a wages plus bonus system.

Associated with this latter method of labour payment has been the development of a system based on a "contract of service". The contract is intended to give the employee as good a return as he enjoyed under the thirtysix and two thirds percent share-milking agreement. It is also adjustable to meet the requirements of "quarter" share farming, in which case the income would be as high as under the twentyseven and a half percent agreement. In effect, the aim of those using such a contract is to utilize some type of share agreement which is outside the scope of the Share-milking Agreements Act of 1937, and in particular the Share-milking Agreements Order of 1946. The contract, if applied, provides for the weekly payment of some set "Manager's wage". In addition the farm owner contracts to pay the milker, or Manager as he may now be termed, a bonus equal to the difference between that wage and thirtysix and two thirds percent of the dairy cheque, less the costs normally borne by the third share-milker. When this type of contract is used, however, the provisions of the Agricultural Workers' Act of 1936 have to be observed as the removal of the system from the scope of the Share-milking Agreements Act automatically brings it within the scope of the former Act.

In Section V it was pointed out that share-milking is unprofitable to both the farm owner and the share-milker when the butterfat output of the farm falls below a certain level. In this section it has been mentioned that the recent

increase the "quarter" and "third" share-milkers' percentage receipts (29) had resulted in some "third" share-farms changing to "quarter" shares, wage labour or "contract of service" labour. This change, it would appear, without accurate and factual data, tends to be most marked in the larger, higher producing and more highly developed farms. It is just this type of farm, ceteris paribus, that is most suited to share-milking, as in these places the butterfat production is high enough to adequately reward all the factors employed. It is tentatively suggested, therefore, that in order to discourage share-milking on the smaller output farms and to encourage it on the more highly productive farms, some system based upon a graduated scale of payments could be adopted.

Under these circumstances the scale of payments to the share-milker might vary, for "third" share farms, between say forty percent on small farms and thirtyfive percent on the large farms. Such a scheme, however, could only be justified provided,

(a) incentives to higher production are retained, and

(b) the income being paid to the share-milker on the larger farms adequately compensates him for the extra managerial duties involved in large unit production.

The full implications of the foregoing proposal are too many to be adequately covered by an analysis of this nature. It is likely, however, that if a method such as this could be fully developed, it would be possible to introduce some degree of flexibility into the present inflexible share-farming system. Therein, it is contended, would lie its greatest merit.

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S E C T I O N VIII

SUMMARY AND CONCLUSIONS.

A survey of a number of dairy farms, on which share-milkers were employed, was carried out in the counties of Franklin, Raglan, Waipa, Piako, Waikato, Matamata and Otorohanga, during the period mid November to mid March, 1946-47. Information was collected from a number of farm-owners and share-milkers concerning the size of, the production on and the capital invested in these farms. Furthermore, data was collected relating to the nature of labour utilisation on the farms as well as to some of the factors influencing the monetary reward accruing to each for labour performed, management exercised and capital invested.

As a result of the analysis of the data collected, the following points became evident.

(1) The "third" share-farms were significantly larger than the "half" share-farms and the former carried herds that were significantly larger than those on the latter. As a result the average total output per farm on the "third" share-farms was nearly double that on the "half" share-farms.

(2) The average carrying capacity of the "half" share-farms was higher than that of the "third" share-farms. These latter farms, in turn, had a higher carrying capacity than "quarter" share-farms.

(3) The average production per cow was higher on "third" share-farms than on the half share-farms, but there appeared to be no significant difference between the two groups in respect to average production per acre.

(4) The amount of capital invested in the farms was seen to be dependant upon three factors.

i) The nature of the contract.
ii) The nature of the supply.
iii) The year in which the farms were purchased and upon the average Dominion butterfat payout in the years immediately preceeding the date of purchase.

(5) The level of the farm owner's capital indebtedness in 1947 was found to be dependent primarily upon the number of years that the farm had been owned and only secondarily upon the general level of prices at the time the farm was purchased. The amount of the share-milker's capital indebtedness was seen to depend upon the nature of the contract. No "third" share-milker had a business mortgage, and of the "half" share-milkers surveyed more than half were debt free.

(6) The labour utilised on these share-milking farms had certain definite characteristics which differentiated it from labour utilised on owner-manager farms.

i) There was a high percentage of share-milkers who were married.

ii) As a result of (i) there was a very high degree of family labour utilisation.

iii) There was a high output of butterfat per labour unit (both shed units and full time labour equivalents). This output per labour unit was proportional to the total output of the farm but was not dependent upon the type of contract.

iv) There was only a small percentage of farm-owners who worked part or full time on the farms. Whether or not the farm owner did work on the farms was largely dependent upon the contract in operation on the farm.

(7) The management-reward of the farm-owner per 000 lbs. B.F. did not appear to be significantly affected by either the nature of the supply or the nature of the contract. Nor was it significantly affected by the farm-owner being a resident or non-resident landlord. Similarly, neither the number of farms owned nor the date of purchase of the farm surveyed had any significant effect upon the management-reward per 000 lbs B.F. Both the management-reward per farm and per 000 lbs. B.F., however, were considerably affected by the size of the total farm output.

(8) The management-reward of the share-milker per 000 lbs. B.F. did not appear to be significantly influenced by the nature of either the supply or the contract. The number of years that the share-milker had been in occupation on the property surveyed apparently had no uniform effect upon his management-reward. The survey, however,

excluded the yearly migrants and it may be found that these would have a lower management-reward than share-milkers who stay for at least two seasons on the same farm. As with the farm-owner, the management reward of the share-milker per farm and per 000 lbs. B.F. was considerably affected by the size of the total farm output.

(9) It would appear that the recent increase in the percentage share of the "third" and "quarter" share-milkers has caused some reduction in the number of farms on which share-milkers are employed.

(10) In order to counter the effect of (9) above it would appear that there is a need for the "industry" to adopt a more flexible type of agreement. Furthermore, in order to counter the sociological, but not necessarily economic, effects of short tenures and annual migrations, there appears to be a necessity for the adoption of some form of agreement that encourages stability and harmony in employer-employee relationships.

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APPENDIX I.

THE SURVEY SCHEDULES

No. 1A

FARM OWNER INFORMATION REQUIRED

1. Area of farm (a) total 154 acres
(b) effective dairying 100 acres
(c) devoted to other uses acres

2. Number of cows in milk (a) night of 15th Jan. 86
(b) effective = 86 x 1.055 = 89.6

3. Nature of supply Cheese

4. Resident on farm YES ~~NO~~

5. Nature of the season Dry

6. Nature of tenure (a) freehold Yes
(b) leasehold - rent £ -
length of tenure -

7. Nature of contract ½ shares

8. Period of ownership 8 years

9. Number of farms owned One

10. Total purchase price £5360 £40 /acre

11. Government capital valuation (date) £ - £ - /acre

12. Today's estimated market valuation £ 8040 £60 /acre

13. Capital invested (a) initially £5360
(b) Capital improvements £2485
(c) amount of mortgage £1065 mortgagee Bank
(d) rate of interest on mortgage at 5%
= £56.5.7
(e) Overdraft £ - at - % interest -
(f) total of equity capital £6780
(g) total of controlled capital £7845

14. Returns (a) butterfat 13154 lbs share
£ 1,942.7.0 £ 971 *
(b) pigs £ - share £ -
(c) calves £ 35.14.0 share £ 18
(d) produce £ - £ -
(e) other stock (i) sheep £ -
(ii) pedigree stock £ -
(iii) culls £ -
(f) payment in kind £ 5.0.0
(g) 5% value of truck (where applicable) £ -
(h) heifers £ -
(i) bulls £ -
(j) town supply £ -

* excludes share-holders' bonus. The share-holders' bonus in which the share milker does not share, has been regarded as a separate source of income for the farm owner.

15. Working costs (a) Labour costs (other than share milker)

	Male	Female	Wages	Keep	Time working
(a) Permanent			£ -	£	
(b) Casual			£ -	£	

(c) Own labour
(i) milking -
(ii) maintenance -

(b) Manure & seed (supplementary crops)		£	-
(c) Pigs		£	-
(d) Shed (i) & power & fuel for water		£	-
	(ii) shovels and ropes	£	-
	Total shed	£	-
(e) Water pumping		£	-
(f) Manure & lime (for maintenance)		£106.19.6	
(g) Droving		£	-
(h) Insurance (i) fire		£)	25.1.5
	(ii) accident	£)	
(i) 2/3 benzine, oil & running costs		£	-
5% value of truck		£	-
10% value of implements		£	-
(j) Outgrazing		£	-
(k) Cartage to factory etc.		£26.14.2	
(l) Stock food and medicine		£10.10.0	
(m) Herd testing		£	-
(n) Sundry farm costs		£2.15.3	
(o) Fencing costs (material &/or labour)		£ (see below	
(p) Pedigree stock (extra cost)		£	-
(q) Rates		£)	49.15.0
(r) Land tax		£)	
(s) Maintenance (i) stock (bulls, deaths calf rearing)		£	-
(ii) bldgs. & piggeries		£)	
(iii) implements		£)	
(iv) plant		£)	67.1.6
(v) truck		£)	
(vi) tractor		£)	
(vii) roads (less labour)		£)	
(t) Depreciation (i) bldgs. & piggeries		£32.10.0	
(ii) implement & plant		£24.15.-	
(iii) tractor		£)	50.10.0
(iv) truck		£)	
(v) travelling.			

ESTIMATE OF RETURNS TO LABOUR, MANAGEMENT AND CAPITAL

(a) Labour costs (i) to share milker (other than contract share)		£	-
(ii) other		£	-
(b) Working costs (a) interest		£56.5.0	
(b) general		£171.19.0	
(c) Maintenance (i) stock		£	-
(ii) plant and implements, buildings, roads, truck, tractor		£67.0.0	
(d) Depreciation (i) buildings		£)	
(ii) plant and implements		£)	107.15.0
(iii) chattels, truck, tractor		£)	
(e) General (i) rates		£)	49.15.0
(ii) land tax		£)	
	Total	£ 453	
Total revenue		£ 994	
Disposable income		£ 541	

Less (i)	personal laboour reward	£ -	
(ii)	interest on equity capital	£ 339	= 5%
	Surplus to management	£ 202	
	Less management charge	£ 10	(See App. IV)
	Pure profit	£ 192	(See App. IV)

Interest on equity capital investment (£202 + 339) =

£ 541 = 7.9%*

*This figure includes the true earnings of management

SHARE MILKER INFORMATION REQUIRED

1. Nature of contract ½ share

2. Nature of Supply Cheese

3. Size of farm (a) Total 154 acres (b) Effective dairying 155 acres
(c) Devoted to other use - acres

4. Number of cows milked (a) night of 15th Jan 86
(b) effective number = 86 X 1.055 = 89.6

5. Length of time on farm three years

6. Capital investment (a) herd £1137
(b) truck £ -
(c) implements £ 56
(d) amount of mortgage £80. Mortgagee, Vendor
(e) rate of interest on mortgage at 5% - £4
(f) overdraft £ - @ - % interest £ -
(g) estimated value of sharemilkers equity today £ —

7. Returns (a) butterfat 18154 lbs share £1,942.7.0 £971
(b) pigs £ - share £ -
(c) calves £35.14.0 share £18
(d) produce £
(e) other stock (i) sheep £ -
(ii) pedigree stock £ -
(iii) culls £56
(f) casual labour £ -
(g) (i) 5% truck depreciation £ -
(ii) 10% plant & implements supplied £ -
(h) payment in kind £75 +
(i) town supply £ -

8. Working costs (a) pigs £ -
(b) shed (i) rubberware £) in R & M
(ii) buckets and brushware £)
(iii) milking power £28
(iv) water heating (½)
(c) fence maintenance £ see below
(d) insurance (i) fire £) 2.17.0
(ii) accident £)
(e) 1/3 benzine, oil and running costs £7.10.0
5% depreciation £ -
(f) whitewash of shed £ -
(g) water pumping (50/50) £ in power
(h) depreciation on implements and plant
(i) implements £56 @ 7½% £4
(ii) plant £ - @ % £ -
(iii) truck £ - @ % £ -
(iv) tractor £ - @ % £ -
(i) repairs and maintenance
(i) herd replacement £114
(ii) implements £)
(iii) plant £) 46
(iv) truck £)
(v) tractor £)

(j) out dissing	£21.0.0
(k) seeds and manure	£ -
(l) sundries	£5.10.0
(m) cartage	£ -
(n) stock food and medicine	£6.6.0
(o) car (tax allowance)	£15.0.0
(p) herd testing	£ -

9. Labour (i) family

	Male	Female	Wages	Keep	Time working
(a) under 16	-	-	£ -	£ -	-
(b) over 16	-	Wife	£64	£ -	2 hrs.per day (milking)

(ii) non-family

	Male	Female	Wages	Keep	Time working
(a) permanent	one	-	£273	incl.	full time
(b) casual 1/3S	-	-	-	-	-
2S			£8		harvesting

ESTIMATE OF RETURNS TO LABOUR AND CAPITAL

(a) Maintenance of	(i) stock		£114
	(ii) plant and implements		£ 46
(b) Depreciation	(i) plant and implements		£ 4
(c) Labour costs			£315
	(i) interest		£ 4
(d) Working costs	(i)		£ 86
	Total		£569
Total revenue			£1120
Disposable income			£551
Less (i) personal labour reward			£273
(ii) interest on equity capital			£ 58 = 5% of £1120
Surplus to management			£220
Less management charge			£30 (see App.IV)
Pure profit			£190 (See App.IV)

FARM OWNER — INFORMATION REQUIRED

1. Area of farm (a) total 140 acres
(b) effective dairying 135 acres
(c) devoted to other uses - acres

2. Number of cows in milk (a) night of 15th Jan. 75
(b) effective = 75 x 1.055 = 78.1

3. Nature of supply Butter

4. Resident on farm YES ~~NO~~

5. Nature of the season Dry

6. Nature of tenure (a) freehold yes
(b) leasehold - rent £ -
length of tenure -

7. Nature of contract 1/3 share

8. Period of ownership 4 years

9. Number of farms owned one

10. Total purchase price £6,600 £47 per acre

11. Government capital valuation (date) £ - £ - / acre

12. Today's estimated market valuation £ - £ - / acre

13. Capital invested (a) initially £6600
(b) capital improvements £1200
(c) amount of mortgage £2400 mortgagee Bank
(d) rate of interest on mortgage at 4½%
= £108
(e) overdraft £ - at - % interest -
(f) total of equity capital £5400
(g) total of controlled capital £7800

14. Returns (a) butterfat 19,606 lbs. Share
£1603 £ 1016
(b) pigs £100 share £ 50 nett
(c) calves £30.10.0 share £ 15.5.0
(d) produce £ - £ -
(e) other stock (i) sheep £ -
(ii) pedigree stock £ -
(iii) culls £ 52
(f) payment in kind £ 5
(g) 5% value of truck (where applicable £
(h) heifers £ -
(i) bulls £ -
(j) town supply £ -

15. Working costs (a) Labour costs (other than share milker)

	Male	Female	Wages	Keep	Time working
(a) Permanent	-	-	£ -	£ -	-
(b) casual	two	-	£ 42 7	£ -	bulldozing harvesting

(c) own labour (i) milking -
(ii) maintenance £27
(b) manure & seed supplementary crops £ -
(c) pigs £ -

(d) shed	(i) ½ power and fuel for water	£5.0.0
	(ii) shovels and ropes	£ (in R&M)
(e) water pumping		£8.15.0
(f) manure & lime (for maintenance		£105.0.0
(g) droving		£2.10.0
(h) insurance	(i) fire	£) 10.6.6
	(ii) accident	£)
(i) 2/3 benzine, oil & running costs		£ -
5% value of truck		£ -
10% value of implements		£ -
(j) outgrazing		£ -
(k) cartage to factory		£ -
(l) stock food and medicine		£25.5.0
(m) herd testing		£16.7.6
(n) sundry farm costs		£11.0.0
(o) fencing costs (material and/or labour)		£ (in R & M)
(p) pedigree stock (extra cost)		£ -
(q) rates		£) 44.0.0
(r) land tax		£)
(s) Maintenance		
(i) stock (bulls, death, calf rearing)		£47.0.0
(ii) Blgs. & piggeries		£)
(iii) implements		£)
(iv) plant		£)
(v) truck		£) 105.10.0
(vi) tractor		£)
(vii) roads (less labour)		£)
(t) depreciation		
(i) blgs. & piggeries		£15.0.0
(ii) implements & plant		£16.0.0
(iii) tractor		£ -
(iv) truck/waggon		£ -
(v) travelling		£15.10.0

ESTIMATE OF RETURNS TO LABOUR, MANAGEMENT AND CAPITAL

(a) Labour costs	(i) to share milker (other than contract share)	£ -
	(ii) other	£49.0.0
(b) Working costs	(a) interest	£108.0.0
	(b) general	£227.10.0
(c) Maintenance	(i) stock	£47.0.0
	(ii) plant and implements, buildings, roads, truck, tractor	£105.10.0
(d) Depreciation	(i) buildings	£)
	(ii) plant and implements	£) 31.0.0
	(iii) chattels, truck tractor	£)
(e) General	(i) rates	£) 44.0.0
	(ii) land tax	£)
	Total	£612.0.0
Total revenue		£1138.0.0
Disposable income		£ 526

Less (i) personal labour reward	£ 27	
(ii) interest on equity capital	£270	=5%
Surplus to management	£229	
Less management charge	£ 30	(See App. IV)
Pure profit	£199	(See App. IV)

Interest on equity capital investment (£229 + 270) =

£499* = 9.2%

* This figure includes the true earnings of management

SHARE MILKER INFORMATION REQUIRED

1. Nature of contract 1/3 share

2. Nature of supply Butter

3. Size of farm (a) total 140 acres (b) effective dairying 135 acres (c) devoted to other use - acres

4. Number of cows milked (a) night of 15th Jan 75 (b) effective number 75 x 1.055 - 79.1

5. Length of time on farm 2 years

6. Capital investment (a) herd £88
(b) truck/car £ -
(c) implements £ -
(d) amount of mortgage £ - mortgagee -
(e) rate of interest on mortgage at % - £
(f) overdraft £ - @ - % interest £ -
(g) estimated value of sharemilkers equity today £ -

7. Returns (a) butterfat 19806 lbs share £1603 £587
(b) pigs £100 share £50 (nett)
(c) calves £ - share £37 (includes payment for calf rearing)
(d) produce £ -
(e) other stock (i) sheep £ -
(ii) pedigree stock £ -
(iii) culls £ -
(f) casual labour £ -
(g) (i) 5% truck depreciation £ -
(ii) 10% plant and implements supplied £ -
(h) payment in kind £75
(i) town supply £ -

8. Working costs (a) pigs £ -
(b) shed (i) rubberware £ see R & M
(ii) buckets and brushware £ see R & M
(iii) milking £)
(iv) water heating (gas) £) 26.10.0
(c) fence maintenance £ -
(d) insurance (i) fire £) 1.0.0
(ii) accident £)
(e) 1/3 benzine, oil and running costs £ -
(f) 5% depreciation £ -
(f) whitewash of shed £ -
(g) water pumping 50/50 £ -
(h) depreciation on implement and plant
(i) implements £ - @ % £ -
(ii) plant £ - @ % £ -
(iii) truck £ + @ % £ -
(iv) tractor £ - @ % £ -
(i) repairs and maintenance
(i) herd replacement £ -
(ii) implements £)
(iii) plant £) 24.7.1
(iv) truck £)
(v) tractor £)

(j) outgrazing	£ -
(k) seeds and manure	£ -
(l) sundries	£5.10.0
(m) cartage	£ -
(n) stock food and medicine	£ -
(o) car (tax allowance)	£12.10.0
(p) herd testing	£ -

9. Labour (i) family

	Male	Female	Wages	Keep	Time working
(a) Under 16	-	-	£ -	£ -	-
(b) over 16	-	Wife	£52	£ -	Milking 4 hrs. per day

(ii) non-family

	Male	Female	Wages	Keep	Time working
(a) permanent	-	-	£ -	£ -	-
(b) casual 1/6 s	two	-	£8	£ -	harvesting
½ s	-	-	£ -	£ -	-

ESTIMATE OF RETURNS TO LABOUR AND CAPITAL

(a) Maintenance	(i) stock	£ -
	(ii) plant and implements	£24.10.0
(b) Depreciation	(i) plant and implements	£ -
(c) Labour costs		£60.0.0
	(i) interest	£ -
(d) Working costs	(i) general	£42.10.0
	Total	£127.0.0
Total revenue		£749.0.0
Disposable income		£622.0.0
Less (i) personal labour reward		£276.0.0
(ii) interest on equity capital		£ 2.0.0 = 5% on £38
Surplus to management		£347.0.0
Less management charge		£ 10.0.0 (See App. IV)
Pure profit		£337.0.0 (" ")

APPENDIX II.

THE SHARE-MILKING AGREEMENTS ORDERS OF 1944 AND 1946.

THE NEW ZEALAND CO-OPERATIVE DAIRY COMPANY'S "HALF-SHARE AGREEMENT"

Serial Number **1944/146**

THE SHARE-MILKING AGREEMENTS ORDER 1944

C. L. N. NEWALL, Governor-General

ORDER IN COUNCIL

At the Government House at Wellington, this 11th day of October, 1944

Present :
HIS EXCELLENCY THE GOVERNOR-GENERAL IN COUNCIL

PURSUANT to the authority conferred upon him by section 4 of the Share-milking Agreements Act, 1937, and being satisfied as to the fact of agreement between the New Zealand Farmers' Union and the New Zealand Workers' Industrial Union of Workers to the revocation of the terms and conditions set out in the Schedule to the Share-milking Agreements Order 1939,* as amended by the Share-milking Agreements Order 1939, Amendment No. 1†, and the substitution therefor of the terms and conditions contained in the Schedule hereto, which shall take effect on and from the date specified herein in that behalf, His Excellency the Governor-General, acting by and with the advice and consent of the Executive Council, doth hereby order as follows :—

I. This Order may be cited as the Share-milking Agreements Order 1944.

II. The terms and conditions set out in the Schedule to the Share-milking Agreements Order 1939, as amended by the Share-milking Agreements Order 1939, Amendment No. 1, are hereby revoked, and the terms and conditions set out in the Schedule hereto substituted therefor.

III. This Order shall operate on and from the 1st day of August, 1944.

SCHEDULE

STANDARD TERMS AND CONDITIONS OF SHARE-MILKING AGREEMENT (APPLICABLE ONLY IN CASES WHERE THE FARMER-OWNER PROVIDES THE HERD) AS SETTLED ON BEHALF OF THE NEW ZEALAND FARMERS' UNION AND THE NEW ZEALAND WORKERS' INDUSTRIAL UNION OF WORKERS

Conditions of Employment for Share-milkers

1. Any agreement shall be operative for the period specified.

2. Before entering into any agreement share-milkers shall have made available to them in writing the previous year's figures of production, the number of cows producing those figures, and the minimum quantity of manure to be applied in any one season.

* Statutory Regulations 1939, Serial number 1939/86, page 370.
† Statutory Regulations 1941, Serial number 1941/155, page 501.

3. Share-milkers whose duties comprise only milking and care, feeding of stock, including pigs, shall receive not less than 25 per cent. of milk and cream cheques and deferred payments. Where he also does maintenance work he shall receive not less than 33⅓ per cent. in either case, after deduction of cartage of cream and milk. To the above shares of 25 per cent. and 33⅓ per cent. shall be added a surcharge of 10 per cent. of the share-milker's share. He shall not contribute towards the payment of any shares nor receive any benefit from the share bonus unless mutually agreed upon.

4. If the farm-owner provides an efficient bull paddock the share-milker shall undertake care and custody of the bull or bulls and other stock, and shall be responsible for damage done by wandering bull or other stock.

5. The share-milker shall receive half-share of the value of all calves, which shall be valued as grades, including bobby calves and pigs, which shall be valued as grades, providing the share-milker buys in as grades.

6. Calves reared shall be valued during January or February as mutually agreed upon. The farm-owner to take over the calves as at that date.

7. The farm-owner may require calves for rearing for replacement purposes up to 25 per cent. of the herd. In cases where additional replacements are needed this number may be increased by agreement in writing at the commencement of the season.

8. Both parties shall pay equally all costs of breeding-sows and other pigs, including cost of supplementary feeding, cartage, and commission.

9. Farm-owner shall provide reasonable facilities for feeding, housing, and grazing all pigs, such reasonable facilities to include separate house for each breeding-sow at farrowing-time. Pigs shall be efficiently ringed according to directions of the farm-owner, and where pigs are not so ringed, the share-milker shall be responsible for any damage done.

10. The farm-owner shall provide motor-lorry or horse conveyance for the purpose of carting milk to the factory and for other farm purposes, except where the share-milker agrees to provide his own. The share-milker to pay one-third of the cost of benzine, oil, and running-costs, also one-third of the registration and license fee, and also depreciation at the rate of 5 per cent. per annum.

11. (*a*) The farm-owner shall provide all implements, plant, and equipment for the efficient working of the farm except where the share-milker agrees to provide his own. Any expense incurred by the farm-owner through damage to his plant or equipment caused by the neglect of the share-milker shall, at the termination of the contract, be the responsibility of the share-milker and be met by him: Provided always that the farm-owner shall provide suitable cover or shed for all such plant and equipment. In the case of a dispute, a competent person shall be appointed, acceptable to both parties, to examine the equipment and to decide the responsibility for payment.

(*b*) Share-milkers agreeing to supply milking-plant, horses, wagons, and cans, or any part of same, shall receive such additional amount as shall be agreed upon for the value of such equipment as at the commencement of the contract, but in no case less than 10 per cent. of the value of such equipment, to be paid in equal monthly instalments. Share-milkers agreeing to supply lorries for the purpose of carting milk to the factory, and for other farm purposes only, shall be paid two-thirds of the cost of benzine, oil, and running-costs, also two-thirds of the costs of registration and license, also depreciation at the rate of 5 per cent. per annum. The farm-owner shall be responsible for meeting the cost of reasonable repairs to such implements except where such repairs are rendered necessary through the neglect of the share-milker. The farm-owner shall provide suitable cover or shed for all such plant and equipment.

12. All rubberware shall be in a satisfactory condition at the commencement of contract, and shall be left by the share-milker in the same condition at termination of contract.

13. Buckets and brushware shall be supplied by the share-milker, but at the commencement of each season the farm-owner shall equip the shed with leg ropes and a shed shovel.

14. The share-milker shall pay power-costs for milking, but it shall be the duty of the farm-owner to supply adequate facilities for boiling water, and to pay half power and fuel costs for same.

15. The farm-owner shall have the right to determine the factory or company to be supplied, and whether milk or cream shall be supplied.

16. The cost of seed and manure for supplementary and/or winter crops shall be borne by the farm-owner, and the work shall be done by the share-milker.

17. General farm-work which shall be done on the farm shall be outlined in writing at the commencement of the contract by the farm-owner and carried out by the share-milker. Stumping, clearing, erection of new fences, and generally breaking in rough farmland to be the responsibility of the farmer, and not to be

included as general farm-work. Where work which is the responsibility of the share-milker is not carried out satisfactorily, the owner, after giving reasonable notice in writing to the share-milker, shall have the right, if it is not performed by the share-milker, to have the work done at the expense of the share-milker. Where through sickness or otherwise the share-milker is unable to carry out his part of the agreement, he shall give notice in writing to the farm-owner so that arrangements can be made to carry out the work. In the event of any dispute regarding the matters contained in this clause, the matter shall be referred to arbitration.

18. Cost of manure for maintenance purposes, including cartage, shall be borne by the farm-owner.

19. The additional labour required for hay and ensilage making for the herd shall be provided by the share-milker and farm-owner equally.

20. The farm-owner shall provide adequate water for stock, sheds, and household purposes. Where satisfactory drinking-water for domestic use cannot be obtained from other sources, sufficient tank accommodation for the collection of rain-water shall be made available at the house of the share-milker. The farm-owner shall pay actual cost of power for pumping water for stock, sheds, and household purposes.

21. Except as hereafter provided, fences, drains, and hedges to be maintained in a satisfactory state of repair by the share-milker, but the cost of trimming any hedge which has not been trimmed within three years shall be borne by the farm-owner. Temporary subdivision fences shall be erected by the share-milker with material supplied by the farm-owner. New permanent subdivision fences shall be erected and paid for by the farm-owner who shall supply all the necessary material. Where drains exceed a length of 1 chain per cow milked, the cost of cleaning the additional length of drains shall be borne on a fifty-fifty basis by the share-milker and the farm-owner, but the responsibility of the share-milker in this respect shall not apply in the case of drains which do not directly drain that portion of the property on which the dairying operations are carried on.

22. Farm-owner shall pay for all herd-testing, including tester's board at 2s. per item.

23. The share-milker shall provide and shall have complete control of all labour to be engaged by him.

24. The share-milker shall bear his proportion of deduction in connection with the grading of milk and cream except in the case of proved neglect, when the responsible party shall bear the whole of such deductions.

25. Farm-owner shall supply all medicines, &c., for the health of stock, same to be used by share-milker as directed. Share-milker shall take all necessary precautions to prevent disease in the herd, and in case of disease shall notify farm-owner immediately, but shall not be held responsible for disease or replacements of stock rendered necessary owing to disease, &c., but due to no neglect or fault of the share-milker. A suitable locker shall be installed in a convenient place.

26. The share-milker shall take all reasonable care to prevent the spread and/or introduction of noxious weeds, the cost of material to be borne by the farm-owner.

27. Share-milker shall whitewash sheds when required by the farm-owner, but not more often than once yearly except at the expense of the farm-owner. Nevertheless, in cases of supply to towns or institutions the shed shall be maintained according to the requirements of the appropriate authorities, the material only to be supplied by the farm-owner. There shall be lavatory accommodation within reasonable distance of the milking-sheds.

28. No additional stock (except replacement stock up to 25 per cent. annually), including sheep, shall be grazed on milking paddocks used by the share-milker except by mutual consent, which consent shall not be unreasonably withheld, and all culls shall be removed from milking paddocks within one month from the date of culling. The share-milker and the farm-owner each to have the right to run up to fifteen sheep for killing purposes.

29. Milking must be efficiently carried out, and the farm-workers shall be competent, but the number and sex to be employed shall be mutually agreed upon between the farm-owner and the share-milker.

30. Share-milker's share of the cheque without any unauthorized deduction shall be paid by farmer direct into share-milker's banking account, or direct to the share-milker, accompanied by copy of monthly statement in either case; settlement to be made within three days of receipt of money by the farm-owner.

31. All moneys due to the share-milker for pigs sold in farm-owner's name by share-milker shall be paid over to the share-milker by the 25th of the month following the sale of same. A statement of all pigs sold to be supplied to the share-milker.

32. If either party does not propose to enter into another contract for a further period, notice thereof shall be given in writing to the other party not less than one month prior to the expiry of the current contract.

33. Farm-owner shall pay all droving fees.

34. The stipulated number of cows to be milked shall be stated in writing, including the words "and not less than." Such stipulated number of cows shall be in-calf cows or heifers, and shall not include cows which prove at calving to have lost two or more quarters.

35. The owner shall have the right at any time during the continuance of this agreement to sell the said land or any part thereof and cancel this agreement, in which case the share-milker shall be entitled to receive from the owner an amount equal to the share-milker's proportion of the value of the estimated butterfat for the balance of the season, including deferred or final payment or bonus. In the event of the owner and the milker failing to agree as to this estimated amount of butterfat, the previous year's production shall be taken as a basis. The total production of butterfat in the previous season for the months in question shall be divided by the number of cows milked during these months giving for the purposes of this agreement a standard production per cow which, multiplied by the number of cows being milked at the time of the sale, will be taken as the amount of butterfat for which payment as above shall be made.

36. A suitable area of ground shall be attached to the accommodation of sufficient size for the share-milker to grow vegetables for his own use. Such area shall be enclosed against cattle and pigs, and where live hedges are planted around the house such hedges shall be maintained by the share-milker.

37. The farm-owner shall decide, after consultation with the share-milker, when the cows are to be dried off.

38. In the event of a dispute arising out of the terms of the contract, each party shall, within thirty days of either party giving notice in writing to the other, proceed to arbitration. Each party shall appoint an arbitrator who shall decide, but in the event of their being unable to agree the arbitrators shall appoint a third party, whose decision shall be final. In the event of the arbitrators being unable to agree on the third party to be appointed, the dispute shall be referred to the Department of Labour, which shall, in collaboration with the Department of Agriculture, appoint a person with the requisite specialized knowledge to settle it.

39. There shall be no reduction during the period of the contract of the area available to the herd except by mutual agreement in writing.

40. In cases where pedigree stock is raised there shall be a mutual agreement entered into between the farm-owner and the share-milker whereby the share-milker shall be recompensed for the extra cost incurred by him.

41. The farm-owner shall, during the continuation of the agreement, insure and keep insured the share-milker and all the workers employed by the farm-owner against any claims under the Workers' Compensation Act, 1922, and its amendments, and shall, when required so to do, produce within thirty days to the share-milker the policy of such insurance, and the receipt for the premiums from time to time payable thereunder, and in case the farm-owner shall make default in so doing, or shall fail to effect or keep such insurance continued, then the share-milker may, if he thinks fit, effect such insurance or pay the premiums thereunder either in his own name or in the name of the farm-owner, and may recover from the farm-owner all the moneys paid for effecting such insurance or renewal thereof.

The share-milker shall, during the continuance of the agreement, insure and keep insured the workers employed by him against any claims under the Workers' Compensation Act, 1922, and its amendments, and shall, when required to do so, produce within thirty days to the farm-owner the policy of such insurance and the receipt for the premiums from time to time payable thereunder, and in case the share-milker shall make default in so doing, or shall fail to effect or keep such insurance continued, then the farm-owner may, if he thinks fit, effect such insurance or pay the premiums thereunder either in his own name or in the name of the share-milker, and may recover all moneys so paid for effecting such insurance or renewal thereof.

42. When the share-milker agrees to perform work outside the scope of the Share-milkers' Agreement, he shall be paid at a rate to be mutually agreed upon in writing, but in no case shall such rate be less than 2s. 6d. per hour, and settlement for any such work shall be made quarterly. Except by agreement with the farm-owner, the share-milker shall not undertake work outside the farm.

43. Bath to be provided at share-milker's house, with arrangements for hot water adjacent thereto.

44. Suitable first-aid appliances shall be provided, the recommended contents of a first-aid outfit are :—

Antiseptic solution with directions for use. (A 4 oz. bottle of Lysol is suggested, and, in addition, an 8 oz. bottle of weak tincture of iodine.)
One yard packet of plain absorbent gauze.
One 4 oz. packet of absorbent cotton-wool.
One 2 oz. packet of plain lint.
Half-dozen 2 in. by 6 yard white open-wove bandage.
4 oz. bottle of 1-per-cent. picric acid for burns.
One 2 oz. tin of boracic ointment.
One spool adhesive Z.O. plaster 2 inches by 5 yards.
1 pair of scissors, 5½ in., blunt points.
One dozen safety pins.
One triangular bandage.
First-aid outfit to be supplied by farm-owner.

45. Reasonable facilities shall be given by the farm-owner or his agent to the union organizer or other official of the union to enable him to transact all business of the union.

46. Each farm-owner shall provide free grazing for one horse for share-milker's own personal use.

C. A. JEFFERY,
Clerk of the Executive Council.

Issued under the authority of the Regulations Act, 1936.
Date of notification in *Gazette* : 19th day of October, 1944.
These regulations are administered in the Department of Labour.

By Authority: E. V. PAUL, Government Printer, Wellington.—1944.
Price 6d.]

1/3 Stamp.

"B"

Share-milking Agreement

Memorandum of Agreement made this day of One thousand nine hundred and

BETWEEN of

Farmer in the Provincial District of (hereinafter termed "the Owner") of the one part

AND of

in the Provincial District of (hereinafter termed "the Milker") of the other part

WHEREAS the Owner is possessed of a farm at

containing acres more or less being

(hereinafter termed "the said land") AND WHEREAS the Milker has agreed to supply a herd of cows and heifers and bulls (hereinafter referred to as "the said cows") farm horses and other live stock (the whole of which cows heifers bulls horses and other live stock are hereinafter referred to as "the said stock") and chattels as in this agreement provided AND WHEREAS the Milker has agreed to milk and attend to the said cows on the said land of the Owner as a dairy farm and to supply and keep on the said land for such purposes the said stock and chattels on and subject to the terms and conditions hereinafter contained.

NOW THIS AGREEMENT WITNESSETH that it is hereby declared and agreed by and between the parties hereto as follows:—

Definition.

1. EXCEPT where the context demands a different construction the term "cows" when used herein shall mean and include all cows heifers and bulls at any time brought on to the said land for any of the purposes of this agreement and the term "stock" when used herein shall mean and include all cows pigs horses and other stock whether alive or dead necessary for any of the purposes of this agrement but shall not include any stock the presence of which on the said land is not necessary for any of the purposes of this agreement. Geese ducks fowls turkeys and other poultry are hereby excluded from the term "stock."

Status of Parties.

2. THIS agreement shall not be deemed to create a partnership between the Owner and the Milker nor shall the Milker be deemed in any way a tenant of the said land or of any buildings thereon nor shall this agreement be deemed to create a bailment of any stock or chattels subject to this agreement and belonging either to the Owner or the Milker.

Period.

3. THIS agreement shall be deemed to commence on the day of One thousand nine hundred and and shall continue until the day of One thousand nine hundred and subject to prior determination as hereinafter provided.

Use of Land.

4. THE Owner shall set apart and allow to be used for the purpose of this agreement the said land and neither the Owner nor the Milker shall during the continuance of this agreement graze or depasture on the said land any stock not subject to this agreement provided nothing here contained shall prohibit the Milker from keeping on the said land dogs and poultry.

Supply of Herd.

5. THE Milker shall throughout the continuance of this agreement supply and maintain a herd of not less than ( ) nor more than ( ) good milking cows and heifers in profit and all necessary bulls and shall by culling and replacements keep the aforesaid herd up to a reasonable standard.

Horses and Implements.

6. THE Milker shall supply ( ) farm horses and such farm implements as may be agreed upon mutually by the parties hereto and specified in writing.

Use of House, Sheds and Implements.

7. THE Milker shall have the right during the continuance of this agreement to use and occupy free of charge the Milker's dwelling house on the said land and also the milking sheds and yard and implements and other sheds now upon the said land.

Appliances.

8. THE Owner shall provide in first class order and condition and appropriate to the use of the Milker for the purposes of this agreement the milking plant engine electric motors or other power plant separator implements and machinery now on the said land and the Milker hereby acknowledges that the same are in good order and condition and ready for immediate use.

Appliances provided by Milker

9. EXCEPT as in this agreement expressly provided otherwise the Milker shall provide at his own cost all other stock gear utensils appliances and implements necessary for the proper and effectual carrying out of this agreement.

Care and Custody of Stock.

10. THE Milker shall properly care for and tend all stock depasturing or being on the said land from time to time during the period of this agreement and shall do all things necessary to keep the same on the said land and shall be responsible and liable for all consequences arising from failure to do so.

Cleaning.

11. THE Milker shall daily clean out all sheds and yards in which the said cows are milked and also will daily wash with boiling water and thoroughly cleanse and keep sweet and clean all utensils and appliances used for the purposes of this agreement and also will daily properly and efficiently clean and sterilize all parts of the milking plant which require cleansing and sterilising and will at all times operate and manipulate the plant and machinery in a skilful and workmanlike manner. All manures taken from the shed or yards shall each day be spread on the said land by the Milker in such places as the Owner may direct. The Milker will whitewash once yearly in a proper manner the interior of all cowsheds on the said land. Any diminution in value or loss of cream or milk arising by reason of inferior grade or grading down of cream or milk due to failure of the Milker to maintain a proper standard of cleanliness in sheds yards utensils or appliances or to manipulate and operate the plant and machinery in a skilful and workmanlike manner may be deducted by the Owner from moneys due to the Milker provided that the Milker shall not be responsible for any diminution in value or loss which may arise from causes beyond his control. The basis of adjustment shall be in the case of default by the Milker that the Owner is entitled to assume all cream or milk supplied will be of finest quality.

Supply of Requisites and Care of Plant.

12. THE Milker shall supply or pay for all brushware and cleaning apparatus necessary for the milking machine and plant and appliances and also all rubbers tubing belting and parts oil fuel benzine and electric power from time to time during the currency of this agreement required for the proper and efficient use and working of the milking plant engine and separator and shall personally do or have carried out all such repairs and replacements as shall from time to time be necessary and shall keep the same in good order condition and repair or pay for and make good all damage done to the same and shall at the end or sooner determination of this agreement hand over the same to the Owner in first class order condition and repair and ready for immediate use (fair wear and tear excepted). The Milker will pay for all electric power used in the dwelling-house occupied by him.

Warranty by Owner.

13. THE Owner hereby warrants the said land to carry satisfactorily the said stock save and except damage to or loss of pasture or crops by fire tempest or Act of God and further hereby warrants that the said land has before the commencement of this agreement been topdressed at the proper season with suitable fertilizer of a quantity per acre not less than is specified in Clause 29 hereof.

Condition and Care of Buildings, Fences, etc.

14. THE Owner shall at his own expense and before the commencement of this agreement place or cause to be placed in good order condition and repair all existing buildings erections fences gates drains and other improvements required for the purposes hereof now on or bounding the said land and the Milker shall during the continuance hereof keep and maintain the same in like order and condition fair wear and tear and damage by tempest fire earthquake or other inevitable accident alone excepted. All material for repairing buildings erections fences and gates shall be supplied promptly by and at the expense of the Owner unless such repairs are occasioned by reason of neglect or default on the part of the Milker in which case the Milker shall provide suitable material.

Noxious Weeds.

15. THE Owner shall at his own cost supply all sprayers appliances and weed killer required for checking or destruction of noxious weeds. The responsibility of the Milker for eradication of noxious weeds shall be limited to maintaining as far as may be practicable the said land in the same condition as at the commencement of this agreement in respect of such weeds.

Dairy Industry Act.

16. THE Milker shall in the course of milking and attending to the said cows and the separating, carting and delivery of the cream or milk and in all other respects comply with the provisions of "The Dairy Industry Act 1908" and all regulations thereunder.

Inspection and Care of Stock.

17. THE Milker shall every day personally see and inspect each of the said cows and shall personally supervise each milking and shall properly attend to such of them as shall have slipped their calves and shall remove any such cow from the other stock and keep the same isolated for a reasonable period to be decided by the Owner. If any stock shall show indications of disease proper steps shall be taken by the Milker for treatment and isolation.

Rearing of Calves.

18. THE Milker may during each and every year of the term of this agreement if he so desires rear as his own property for the purpose of replacements in and maintenance of the said cows heifer calves to a number not exceeding twenty per centum (20%) of the cows and heifers in profit in that year. The heifer calves so reared may be fed on new milk and then on skim milk or whey for the respective periods of such feeding in accordance with the practice generally observed in the adjacent district. Any heifer calves so reared and not utilized in due course for replacement in and maintenance of the said cows shall be sold at a date to be agreed upon mutually and the proceeds divided in equal shares between the Owner and the Milker provided that at the termination of this agreement all heifer calves reared under this clause and not then used for replacement shall be and remain the property of the Milker.

Sale or Killing of Calves.

19. SUBJECT to the provisions of Clause 18 hereof the Milker shall within seven days of the birth of calves have the option of deciding what calves if any of the said cows shall be sold or killed or otherwise disposed of. Any calves not reared or sold shall be killed and skinned by the Milker and the skins thereof as well as the proceeds of sale of calves shall belong to the Owner and the Milker in equal shares.

Proceeds of culled or discarded Stock & Chattels.

20. SUBJECT to the provisions of Clauses 18 and 19 hereof and except as may be otherwise expressly provided in this agreement the said stock and chattels shall be and remain the property of the Milker and the proceeds of the sale of any animal or chattel culled or discarded shall be the property of the Milker.

Dates of Calving, etc.

21. THE Milker shall at all proper times take all necessary steps to have the said cows effectively served and got in calf and will before service have the said cows syringed out if so required by the Owner. The Milker shall faithfully and properly record in writing the dates of all calvings and of all services of the said cows and furnish the same to the Owner when demanded. The Milker shall not use in manner provided by this agreement the milk of any cow until five clear days after calving.

Sale of Cream or Milk

22. THE Owner shall have the sole right to determine to which Factory the supply of cream or milk shall be delivered and will make all necessary arrangements for the sale and disposal in his name of the said cream or milk and shall each month collect from the factory or creamery proprietors all moneys due on account of same and shall within seven days of the receipt thereof and subject to any adjustment under this agreement pay to the Milker thereof and will at all reasonable times produce to the Milker all books accounts and records showing particulars of the weight and value of the said cream or milk. If the Milker so desires the Owner shall arrange with and authorise the dairy company to furnish the milker regularly with copies of monthly and other credit notes showing particulars of the quantity test and grade of cream or milk supplied and the gross value thereof. The Owner hereby nominates as the factory to which the supply of milk or cream shall be delivered the factory of the New Zealand Co-operative Dairy Company, Limited, at .

Cream and Milk.

23. WHERE the Owner is selling cream the Milker shall after each milking separate the cream from the milk produced by the said cows (excepting a sufficient quantity for his own household use and for use in the household of the Owner not exceeding one gallon of whole milk each daily) and shall deliver each morning the cream so separated to the proper delivery or collecting point or railway station not later than a time to be stipulated by the Owner provided however that should the Owner desire during the currency of this agreement to supply whole milk the Milker shall deliver such milk as instructed by the Owner. Where the Owner is selling milk the Milker shall properly cool and treat the milk and without separating will deliver the milk produced from the said cows to the cheese casein or other factory stipulated by the Owner at such times as may be required by the Owner and will cart back to the said land all skim milk or whey. Where delivery of milk direct to the factory is required the Milker shall effect delivery at his own expense and shall supply any vehicle for that purpose and in such case shall be entitled to receive any premium for direct delivery paid by the factory proprietors. Should it become necessary or advantageous during the continuance of this agreement to separate the milk on the said land because of a breakdown at either factory or farm or for any other reason the Milker agrees to be governed by the terms of this clause referring to the supply of cream.

Change of Supply.

24. IN the event of the Owner deeming it necessary or desirable during the term of this agreement to change the incidence of the supply from cream to milk or vice versa he shall at his own expense provide all additional plant gear cans utensils and appliances required for the change. Where the change is made at the request of the Milker and with the consent of the Owner the Owner shall provide at his own cost any additional plant and the Milker shall provide at his own cost any additional cans utensils appliances and vehicles which may be required.

Deduction.

25. THE Owner shall be entitled from time to time to deduct from the moneys payable by him to the Milker all moneys due or to become due and payable by the Milker to the Owner under the provisions of this agreement.

Pigs.

26. THE Owner and the Milker shall in equal proportions supply the pigs for the purposes of this agreement and at the end or sooner determination of this agreement and subject to the provisions hereinafter contained for valuation of pigs each will as far as is practicable be entitled in equal proportion to pigs of the like number and value provided that each will be entitled to have included in his proportion and to retain any specific pig or pigs supplied by him at the commencement hereof. The Owner and the Milker shall each have a half interest in the proceeds or value of all other pigs. The Milker shall properly care for and feed all pigs and shall keep the paddocks and styes in which the pigs are kept clean and well and securely fenced. All pig feed shall be found by the Owner and the Milker in equal proportions provided that the Milker shall have the right to utilize the skimmed milk for the pigs.

Sale of Pigs.

27. PIGS or their progeny shall at such time or times as the Owner shall direct be sold in the name of the Owner. Half the proceeds of the sale of all pigs shall within seven days of receipt of same by the Owner be paid to the Milker but if at the time of sale there shall be any balance owing by the Milker to the Owner on the pig account or in respect of any other indebtedness by the Milker to the Owner such half share of proceeds shall be credited to the Milker either to pig account or any other such indebtedness.

Valuation of Pigs

28. IMMEDIATELY upon the determination of this agreement the Owner and the Milker shall endeavour mutually to agree upon a value of pigs held on joint account and failing an agreement a competent valuer shall be called upon to assess the value of such pigs the cost of the valuation to be borne in equal proportions by the Owner and the Milker. If the Owner and the Milker cannot agree as to the appointment of a valuer the value of the pigs shall be determined by arbitration as hereinafter provided, the cost of arbitration to be borne in equal proportions by the parties. When the value has been decided the Owner shall credit half the said value to the Milker's account and the credits shall be used to offset any debits and any balance due to the Milker shall be included in the final settlement between the Owner and the Milker provided that the value of any pig or pigs retained by the Milker under Clause 26 hereof shall be debited to his account.

Top-dressing.

29. EXCEPT as is otherwise expressly provided in this agreement the Owner shall at his own cost supply provide and transport to the said land sufficient fertilizer to top-dress the pasture portions of the said land with not less than hundredweight (cwt.) per acre exclusive of lime in each year of the term of this agreement. The Milker shall each year at the time or times mutually agreed upon with the Owner but so nevertheless that the said pasture portions of the said land shall be topdressed once at least in each year during the term of this agreement properly top-dress whether with fertilizer and/or lime the said pasture portions and shall after each top-dressing chain harrow the whole of the land so top-dressed. The first of such top-dressings of fertilizer shall be applied not later than the month of in the first year hereof.

Root Crops and Feeding out.

30. THE Milker shall sow in root crops for winter feed and shut up for the purposes of hay and/or ensilage such portion of the said land and at such times as the Owner shall direct provided such portion shall not exceed the area required for hay ensilage or roots for the purpose of providing supplementary summer or autumn feeding and wintering of the said stock. The Milker shall whenever required by the Owner cut pull cart and feed to the stock green feed roots hay ensilage or other fodder. Seed and manure for root crops shall be found in equal shares by the Owner and the Milker.

Planting and Harvesting.

31. THE Milker shall at his own cost in all things do or cause to be done the carting out and distribution of fertilizer and lime on the said land and shall also in each year at his own cost in all things including the employment of such labour as shall be necessary cut cart and completely harvest stack and thatch hay and fence-in stacks and lay down ensilage for winter feed for the said stock and shall on the determination of this agreement leave on the said land all hay ensilage and other winter feed and in no case shall the quantity or acreage of feed so left be less than the quantity or acreage which is now on the said land. The Milker will generally farm the land in a proper and husbandmanlike manner and subject to the provisions of clause 15 hereof shall keep the same and the roadways adjoining the same to the centre thereof free and clear of all noxious weeds and growths and will at the proper season of the year trim in a workmanlike manner all live hedges upon or bounding the said land. Where labour for performance of the whole or any portion of the farm work is provided by or at the expense of the Milker he shall be responsible to the Owner for the skilful and workmanlike completion of such work and shall make good to the Owner any loss arising by reason of faulty workmanship. The area of crop to be grown annually except as otherwise provided by this agreement shall be determined by mutual arrangement between the parties and if not so determined shall be settled by arbitration in manner hereinafter provided.

Cropping New Land.

32. WHERE any new ground is required to be broken up and sown in grass or crop (and save as in this agreement otherwise expressly provided it shall be in the sole discretion of the Owner as to when how and what particular land shall be so treated) the Owner shall at his own cost clear plough and prepare the same for sowing and provide all necessary seed and fertilizer but all other work in connection with such breaking-up sowing and cropping shall be done by the Milker at his own cost. The area of any new ground to be broken up under the conditions of this clause shall not exceed an area which in conjunction with the area then in cultivation will be required for the wintering of or supply of green feed necessary for the stock. The Milker shall not be required to assist or participate in the grassing or cropping of any land except and unless the same be required for the pasturage or feeding of the said stock. The same conditions with regard to cropping new land shall apply to any renewal or renovation of existing pasture undertaken during the term of this agreement.

Assignment of Rights.

33. THE Milker shall not assign any of his rights, privileges or benefits under this agreement without the consent in writing of the Owner first had and obtained.

Accident Insurance.

34. THE Milker shall before commencing operations under this agreement insure and shall during the continuance of this agreement keep insured all workers employed by him against claims under the "Workers' Compensation Act 1922" and its amendments such policy to be taken out in his own name. The Milker shall from time to time deliver such policy and the receipts of the premiums from time to time payable thereunder to the Owner and in case the Milker shall make default in so doing or shall fail to effect or keep on foot such insurance then the Owner may if he thinks fit effect such insurance or pay the premiums thereunder either in his own name or in the name of the Milker and may deduct all moneys so paid for effecting such insurances or in premiums thereunder from moneys payable to the Milker. The moneys payable under the said policy effected in the name of the Milker or the Owner shall be applied in payment of the claims to become payable to any worker in exoneration of any possible claim against the Owner or the Milker as the case may be. The Owner shall insure the Milker as a worker and the premium for so doing shall be paid by the Owner.

Water Supply.

35. THE Owner shall be responsible for a sufficient water supply for the said land and stock and shall provide all engines motors pumps benzine oil and electric power required for the purpose. The Milker shall attend to the water supply for the said stock and will constantly keep available a sufficient quantity for well and properly watering such stock. The Milker will also keep all water holes clear and clean.

Employment of Assistants.

36. THE Milker shall have the right to employ such apprentices assistants or labourers as he may require to enable him to carry out his obligations under this agreement but he shall in no case employ on the said land any person or persons whom the Owner shall reasonably forbid him to employ.

Protection of Shelter.

37. THE Milker shall and will not fell or damage any native or other bush or trees or hedges upon the said land without the express consent of the Owner first had and obtained in writing.

Control of Farm.

38. THE Owner shall retain the management and control of the said land and of all operations thereon and at his sole discretion shall decide all questions of policy relating to the carrying out of this agreement and the efficient farming of the said land provided nothing herein shall make it obligatory upon the Milker to carry out and observe instructions by the Owner detrimental to the said stock and implements the property of the Milker. To the intent that the payments and emoluments arising and payable under this agreement from the use of the said land and the said stock will be as great as possible the Milker shall in all things observe and follow approved farming practice in an endeavour to obtain milk and cream of finest quality.

Payments to Milker.

39. THE Milker shall in addition to other emoluments hereunder and subject to any adjustment under this agreement be entitled to of all bonuses and deferred payments if any (excepting as hereinafter provided) declared and paid by the factory or creamery proprietors to whose factory the cream or milk from the said stock is supplied such proportion to be paid to the Milker within seven days of receipt thereof by the Owner. Provided that the Milker shall not be entitled to participate in any special credits or cash payments made to the Owner for the reason that the Owner is a shareholder in the Company to which cream or milk is sent, that is to say the Milker shall not be entitled to claim any portion of deductions or payments made by the factory or creamery proprietors on acccount of capital shares or interest.

Prior Determination of Agreement.

40. IF the Milker shall make default in the observance or performance of any of the terms and conditions expressed or implied herein and has not within seven days after written notice by the Owner so to do remedied any such default the Owner may at his option without further notice or demand whatsoever thereupon or at any time thereafter determine this agreement (in which case the Milker shall be entitled only to moneys actually due to him at date of such determination) without prejudice however to the right of the Owner to recover damages for the non-performance by the Milker of any stipulation or agreement herein expressed or implied and without prejudice to any other rights of the Owner hereunder.

Death of Milker or Owner.

41. IN the event of the death of the Milker occurring during the currency of this agreement the Owner shall be entitled to determine the agreement as from the death of the Milker in which case the estate of the Milker shall be entitled to all moneys due to the Milker at the date of death including a share of the bonus or deferred or final payment but subject to any adjustment which would have been made between the Owner and the Milker regarding the sale of calves calf-skins and pigs or any matters dealt with in this agreement. In the event of the death of the Owner this agreement shall terminate in the year of such death or in the next succeeding year as the case may be upon the day of the month hereinbefore provided in Clause 3 of this agreement for the termination hereof.

Grazing of Sheep.

42. THE Milker shall have the right to depasture on the said land sheep for killing purposes for home consumption only up to but not exceeding at any one time the number of

Arbitration.

43. ANY and every dispute difference or question which may at any time hereafter arise between the parties hereto or their respective representatives as to the construction of these presents or as to any matter or thing connected with or arising out of these presents or the rights duties or liabilities of the parties hereto shall in the absence of any provision to the contrary herein contained be referred to arbitration in accordance with and subject to the provisions of "The Arbitration Act 1908" or any statutory amendment or modifications thereof for the time being in force and the provisions of this clause shall be deemed to be a submission to arbitration within the meaning and subject to the provisions of the said Act.

AS WITNESS the hands of the parties hereto:

SIGNED by the said..... as Owner } .....

in the presence of

Name .....

Address .....

Occupation .....

SIGNED by the said..... as Milker } .....

in the presence of

Name .....

Address .....

Occupation .....

DATE.....19

Share-milking Agreement

Under Share-milking Agreements Act, 1937

BETWEEN

.....

AND

.....

Waikato Times Print 52730 7/1945

APPENDIX III.

SUMMARY OF WORKING DATA

Farm No.	Total B.F. Production (lbs.)	B.F. Prodn. per Acre (lbs.)	Effective Area (Acres)	B.F. Prodn. per Cow (lbs.)	Effective No. of Cows	Type of Supply	Type of Contract	Investment per Cow (Owner)	Investment per Cow (S/Mr)	Investment per Cow Total	Date of Purchase	No. Shed Units of Labour	No. of Full-time Labour Equivalents
1	20906	133.1	157	235.9	88.6	B	4	66.2	0.2	66.4	1924	2	2.13
2	18559	77.2	240	152.8	121.2	B	4	55.6	0.2	55.8	1932	4	4.42
3	25694	142.7	180	209.9	122.4	B	4	55.2	0.4	55.6	1915	3	3.26
4	32995	184.3	179	250.1	131.9	C	4	36.3	0.0	36.3	1939	3	3.01
5	17631	96.9	182	185.3	94.9	B	1/3	70.3	0.4	70.7	1906	2	1.35
6	16818	97.3	172	179.1	93.9	B	1/3	77.3	0.4	77.7	1938	2	1.46
7	17609	80.3	219	201.0	87.6	B	1/3	70.7	0.4	71.1	1925	3	2.57
8	12004	195.6	62	259.7	46.4	B	1/3	34.7	1.0	35.7	1925	2	1.22
9	8587	124.4	69	138.1	45.4	B	1/3	62.0	0.4	62.4	1936	2	1.27
10	14111	96.6	146	164.4	85.8	B	1/3	36.7	0.5	37.2	1936	2	1.45
11	25260	152.0	166	254.5	107.6	B	1/3	53.4	0.3	53.7	1944	3	2.33
12	23328	158.3	150	251.1	94.9	B	1/3	91.7	0.5	92.2	1942	3	2.58
13	26000	130.0	200	224.1	116.0	B	1/3	71.3	0.0	71.3	1920	3	2.45
14	21044	118.2	178	237.5	88.6	B	1/3	103.3	2.0	105.3	1928	3	3.15
15	19521	157.4	124	217.6	89.7	B	1/3	38.3	0.4*	39.2	1919	+	-
16	19364	164.1	118	241.4	80.2	B	1/3	118.1	0.0	118.1	1921	3	2.29
17	14366	135.5	105	193.9	73.1	B	1/3	75.4	0.0	75.4	1944	2	2.32
18	13157	119.5	110	146.0	73.3	B	1/3	77.6	0.2	77.8	1929	2	2.14
19	18000	100.0	180	166.6	108.7	B	1/3	66.9	0.4*	67.3	1911	-	-
20	20110	162.2	124	307.1	97.1	B	1/3	65.2	0.2	65.4	1935	2	2.12
21	19606	108.9	195	247.9	79.1	B	1/3	75.3	0.1	75.4	1944	2	1.59
22	18062	159.2	114	251.5	71.7	B	1/3	92.9	0.4	93.2	1926	2	1.44
23	17959	102.0	176	171.0	99.2	B	1/3	94.5	0.6	95.1	1930	2	2.08
24	25556	103.0	248	210.7	121.3	B	1/3	55.9	0.2	56.1	1934	5	5.00
25	19304	128.7	150	240.7	80.2	B	1/3	97.3	0.4	97.7	1929	2	1.74
26	13000	187.5	56	227.3	79.1	B	1/3	70.2	0.4*	70.6	1942	-	-
27	20001	130.7	153	201.6	99.2	B	1/3	94.5	0.0	94.5	1919	2	2.00
28	21994	146.6	150	242.5	90.7	B	1/3	37.2	0.4	37.6	1928	2	1.54
29	19951	133.0	150	205.5	97.1	B	1/3	77.6	0.4*	78.0	1936	-	-
30	14500	210.2	69	255.8	55.9	B	1/3	33.9	0.4*	34.3	1941	-	-
31	26900	236.5	101	266.5	90.7	C	1/3	120.6	0.0	120.6	1920	3	2.58
32	22284	200.7	111	229.5	97.1	C	1/3	-	4.5	-	-	2	-

Farm No.	Capital Indebtedness per Cow (Owner)	Capital Indebtedness per Cow (S/M)	Capital Indebtedness per Cow (Total)	% Capital as Mortgage (Owner)	% Capital as Mortgage (S/M)	% Capital (Total) as Mortgage	Resident on Farm or not (Owner)	Number of Farms Owned	Number of Years on Farm (S/M)	Family Income (S/M)
1	19.7	0.0	19.7	29.7	0.0	29.7	no	1	5	641
2	12.4	0.0	12.4	23.1	0.0	23.0	yes	2	2	538
3	30.1	0.0	30.1	56.6	0.0	56.1	no	1	1	521
4	30.3	0.0	30.3	35.1	0.0	35.1	yes	1	1	1023
5	0.0	0.0	0.0	0.0	0.0	0.0	no	1	4	605
6	44.7	0.0	44.7	57.8	0.0	57.5	no	5	6	629
7	0.0	0.0	0.0	0.0	0.0	0.0	no	2	5	429
8	0.0	0.0	0.0	0.0	0.0	0.0	no	2	10	452
9	0.0	0.0	0.0	0.0	0.0	0.0	no	1	3	344
10	9.0	0.0	9.0	15.9	0.0	15.7	no	-	3	424
11	23.2	0.0	23.2	43.4	0.0	43.2	yes	1	3	773
12	0.0	0.0	0.0	0.0	0.0	0.0	no	2	2	873
13	34.5	0.0	34.5	48.2	0.0	48.2	yes	1	2	883
14	4.5	0.0	4.5	4.3	0.0	4.2	yes	1	2	901
15	28.0	0.0*	28.0	31.5	0.0	31.3	yes	1	-	-
16	12.5	0.0	12.5	10.6	0.0	10.6	yes	1	8	697
17	11.6	0.0	11.6	15.4	0.0	15.3	yes	2	2	343
18	11.1	0.0	11.1	14.3	0.0	14.3	yes	1	8	618
19	14.7	0.0*	14.7	22.0	0.0	21.9	yes	1	-	-
20	11.3	0.0	11.3	17.9	0.0	17.8	no	1	3	640
21	30.3	0.0	30.3	41.3	0.0	41.3	yes	1	1	684
22	11.2	0.0	11.2	13.5	0.0	13.5	yes	2	3	740
23	44.1	0.0	44.1	46.7	0.0	46.4	yes	1	5	407
24	0.0	0.0	0.0	0.0	0.0	0.0	yes	3	10	985
25	13.1	0.0	13.1	13.4	0.0	13.3	yes	2	2	786
26	4.4	0.0*	4.4	5.3	0.0	5.2	no	1	-	-
27	25.4	0.0	25.4	26.9	0.0	26.9	yes	1	1	561
28	32.9	0.0	32.9	37.7	0.0	37.5	no	1	6	871
29	6.9	0.0*	6.9	8.9	0.0	8.7	no	1	-	-
30	51.9	0.0*	51.9	61.9	0.0	61.6	no	2	-	-
31	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	6	879
32	-	0.0	-	-	0.0	-	-	-	5	334

Farm no.	Total B.F. Production (lbs.)	B.F. Prodn. per Acre (lbs.)	Effective Area (Acres)	B.F. Prodn. per Cow (lbs.)	Effective No. of Cows	Type of Supply	Type of Contract	Investment per Cow (Owner)	Investment per Cow (S/H)	Investment per Cow Total	Date of Purchase	No. of Shed Units of Labour	No. of full-time Labour Equivalents
33	45690	224.0 No. Y.S.	195	276.1	130	C	1/3	13.5			1917	-	-
34	-	-	144	-	98.7	C	1/3	100.0	0.0	100.0	1916	2	-
35	25451	120.3	195	202.2	116.0	C	1/3	90.5	0.3	90.8	1944	3	3.75
36	14300	181.0	79	222.4	64.3	C	1/3	94.7	0.2*	94.6	1941	-	-
37	22524	140.8	160	177.9	126.6	C	1/3	95.5	0.2*	95.7	1939	-	-
38	17155	122.5	140	190.6	90.3	C	1/3	77.1	0.0	77.1	1938	3	2.39
39	12485	139.7	90	187.2	66.5	C	1/3	80.7	0.0	80.7	1937	2	1.54
40	16600	104.6	160	171.9	79.1	C	1/3	78.0	0.1	78.1	1922	2	1.33
41	24322	185.7	131	230.5	105.5	C	1/3	111.0	0.0	112.0	1919	3	3.00
42	27000	159.3	170	257.0	115.9	C	1/3	104.9	0.2*	104.1	1930	-	-
43	53.571 / 60000	② 108.3	② 650	② 190.6	② 559.7	C	1/3	① 59.2	① 0.3	① 59.5	1936	4 / -	4.49 / -
44	15759	257.0 No. Y.S.	58	266.1	61.7 45	C	1/3	96.1	0.2*	96.3	1938	-	-
45	14158	155.6	91	206.4	68.6	C	1/3	74.4	0.0	74.4	1937	2	1.44
46	18500	168.2	110	192.7	96.0	C	1/3	75.8	0.0	75.8	1940	4	2.19
47	26000	130.0	200	176.0	147.7	C	1/3	150.7	0.0	150.7	1920	3	2.99
48	24954	209.5	119	234.1	106.5	C	1/3	116.1	0.0	116.1	1943	3	3.37
49	24600	166.2	148	226.6	108.7	C	1/3	95.7	0.1	95.8	1928	3	2.42
50	21582	195.0	162	269.4	101.9	C	1/3	94.5	0.2*	94.7	1919	-	-
51	10912	110.2	99	137.9	79.1	C	1/3	62.5	0.0	62.5	1929	2	1.50
52	19200	193.6	99	192.4	99.6	C	1/3	-	0.1	-	-	2	-
53	-	-	120	-	79.1	C	1/3	-	0.0	-	-	2	-
54	35960	97.2	370	228.7	157.2	D.M	1/3	61.1	3.7	64.8	1941	3	3.42
55	13454	195.0	69	212.5	63.3	D.M	1/3	75.0	1.7	76.7	1916	2	1.18
56	17360	219.7	79	253.1	68.6	D.M	1/3	34.9	0.0	34.9	1926	2	1.48
57	13200	126.0	148	172.5	105.5	D.M	1/3	60.0	0.0	60.0	1934	3	3.77
58	24461	203.8	120	254.3	134.4	D.M	1/3	94.3	0.0	94.3	1926	3	2.33
59	-	-	169	-	94.4	D.M	1/3	120.0	0.5	120.5	1931	2	2.38
60	-	-	196	-	116.0	D.M	1/3	68.1	0.0	68.1	1937	3	2.70
61	29270	155.7	188	245.3	120.3	D.M	1/3	77.5	0.0	77.5	1931	3	2.75
62	34330	166.9	206	232.3	147.7	D.M	1/3	55.6	0.0	55.6	1936	3	3.33
63	13758	147.9	93	224.3	61.2	B	2	92.5	17.3	109.8	1943	2	1.50
64	8000	26.1	330	59.2	134.3	B	2	68.1	14.3	82.9	1932	2	1.33

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Farm No.	Capital Indebtedness per Cow (Owner)	Capital Indebtedness per Cow (S/M)	Capital Indebtedness per Cow (Total)	% Capital as Mortgage (Owner)	% Capital as Mortgage (S/M)	% Capital (Total as Mortgage	Resident on Farm or not (Owner)	Number of Farms Owned	Number of Years on Farm (S/M)	Family Income (S/M)
33	0.0	-	-	0.0	-	-	yes	2	-	-
34	0.0	0.0	0.0	0.0	0.0	0.0	yes	3	2	498
35	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	2	968
36	0.0	0.0*	0.0	0.0	0.0	0.0	yes	2	-	-
37	23.7	0.0*	23.7	25.3	0.0	25.3	yes	2	-	-
38	0.0	0.0	0.0	0.0	0.0	0.0	yes	2	4	758
39	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	2	397
40	0.0	0.0	0.0	0.0	0.0	0.0	yes	2	2	565
41	23.7	0.0	23.7	21.2	0.0	21.2	no	1	5	867
42	11.4	0.0*	11.4	11.9	0.0	10.9	yes	1	-	-
43	0.0	0.0	0.0	0.0	0.0	0.0	yes	2	8	1357 -
44	31.9	0.0*	31.9	36.9	0.0	36.9	yes	1	-	-
45	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	3	684
46	17.7	0.0	17.7	24.0	0.0	24.0	yes	1	2	876
47	57.5	0.0	57.5	44.0	0.0	44.0	yes	1	3	593
48	54.7	0.0	54.7	47.1	0.0	47.1	no	1	3	603
49	51.5	0.0	51.5	60.0	0.0	59.9	yes	1	5	813
50	36.4	0.0*	36.4	39.5	0.0	39.4	no	1	-	-
51	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	2	560
52	-	0.0	-	-	0.0	-	-	-	3	448
53	-	0.0	-	-	0.0	-	-	-	10	578
54	0.0	0.0	0.0	0.0	0.0	0.0	no	-	2	1130
55	0.0	0.0	0.0	0.0	0.0	0.0	no	6	3	504
56	28.4	0.0	28.4	33.4	0.0	33.4	no	2	4	623
57	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	5	700
58	14.4	0.0	14.4	15.3	0.0	15.3	yes	1	6	625
59	13.7	0.0	13.7	11.4	0.0	11.3	no	2	1	439
60	39.2	0.0	39.2	37.6	0.0	37.6	yes	1	3	1027
61	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	6	993
62	32.9	0.0	32.9	50.1	0.0	50.1	yes	1	3	1053
63	29.4	0.0	29.4	31.9	0.0	36.8	no	1	2	517
64	0.0	7.7	7.7	0.0	52.0	9.3	yes	3	3	454

Farm No.	Total B.F. Production (lbs.)	B.F. Prodn. per Acre (lbs.)	Effective Area (Acres)	B.F. Prodn. per Cow (lbs.)	Effective No. of Cows	Type of Supply	Type of Contract	Investment per Cow (Owner) £	Investment per Cow (S/M) £	Investment per Cow Total £	Date of Purchase	No. Shed Units of Labour	No. of Full-time Labour Equivalents
65	11652	135.9	86	132.8	88.0	B	A	92.7	17.1	109.9	1919	2	1.46
66	23000	115.0	200	171.7	126.6	B	A	79.9	15.9	97.7	1924	3	2.44
67	16242	97.8	166	171.1	94.9	B	A	61.9	14.[illegible]	75.9	1936	2	2.14
68	5477	51.2	107	126.9	43.2	B	A	75.2	14.4	89.6	1932	1	1.00
69	11500	94.9	119	172.6	66.6	B	A	84.0	19.8	103.8	1930	2	1.73
70	18710	73.9	253	194.7	101.0	B	A	89.5	-	-	1930	-	-
71	7520	101.6	74	151.6	49.6	B	A	84.9	15.4	70.2	1935	1	1.30
72	12497	154.3	81	267.1	54.7	B	A	74.8	16.6	91.4	1930	2	1.51
73	15022	151.7	99	219.0	68.6	B	A	62.5	15.9	78.1	1944	2	1.48
74	9892	125.2	79	234.4	42.2	B	A	76.9	15.5	87.2	1934	2	1.33
75	10778	90.6	119	153.7	87.5	B	A	-	14.6	-	-	2	-
76	12475	135.6	92	158.9	78.0	B	A	69.9	15.4	84.3	1926	2	1.33
77	15479	118.2	131	195.7	79.1	B	A	56.5	-	-	-	-	-
78	25000	263.1 No. Y.S.	95	238.4	97.6 75	B	A	70.4	14.2	84.6	1916	2	2.10
79	12576	85.5	147	175.8	69.6	B	A	66.8	17.1	73.3	1932	3	1.69
80	-	-	106	-	56.0	B	A	-	16.0	-	-	2	-
81	11119	140.7	79	211.0	52.7	B	A	-	-	-	1921	-	-
82	14260	144.1	99	171.0	83.6	B	A	82.7	14.3	77.0	1936	2	1.36
83	6000	60.0	100	142.2	42.2	B	A	55.1	12.5	67.6	1936	2	1.35
84	-	-	250 ②	-	112.0 ②	B	A	47.4 ②	13.9 ①	60.3	1924	2 ①	2.16 ①
85	19000	151.6	119	198.4	97.1	B	A	46.1	-	-	1942	-	-
86	15575	155.7	100	223.9	69.6	B	A	84.9	15.0	109.8	1942	2	1.69
87	-	-	305 ⑤	-	405.3 ⑤	B	A	47.7 ⑤	-	-	1921	-	-
88	15000	127.4	102	175.9	78.7	B	A	-	15.2	-	-	2	-
89	18000	100.0	120	142.2	94.4	B	A	86.0	-	-	1943	-	-
90	10674	148.2	70	208.0	50.6	B	A	43.1	-	-	1919	-	-
91	15000	131.6	114	178.6	78.1	B	A	-	16.0	-	-	2	-
92	15990	152.4	120	178.6	84.4	C	A	70.4	21.1	91.5	1927	2	1.50
93	18134	156.6	133	199.9	90.7	C	A	83.5	16.0	109.5	1916	2	1.53
94	27870	156.6	178	311.6	151.9	C	A	64.0	19.0	84.8	1943	4	4.26
95	20547	205.5	99	273.7	75.8	C	A	78.4	14.0	92.4	1930	3	2.25
96	10395	103.9	100	142.7	72.9	C	A	83.0	14.4	97.4	1925	2	1.42
97	29200	196.0	149	366.8	135.4	C	A	-	14.8	-	-	4	-

Farm No.	Capital Indebtedness per Cow (Owner)	Capital Indebtedness per Cow (S/M)	Capital Indebtedness per Cow (Total)	% Capital as Mortgage (Owner)	% Capital as Mortgage (S/M)	% Capital (Total) as Mortgage	Resident on Farm or not (Owner)	Number of Farms Owned	Number of Years on Farm (S/M)	Family Income (S/M)
65	0.0	0.0	0.0	0.0	0.0	0.0	no	1	7	513
66	19.7	7.9	27.6	26.7	56.8	31.5	yes	1	2	740
67	16.9	0.0	16.9	27.3	0.0	22.3	yes	1	4	710
68	0.0	9.3	9.3	0.0	64.6	10.4	no	3	1	341
69	13.3	0.0	13.3	15.9	0.0	12.9	no	2	1	423
70	19.8	-	-	47.6	-	-	no	1	-	-
71	58.9	2.1	61.0	96.5	52.6	96.3	no	2	1	339
72	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	2	415
73	24.3	5.8	30.1	80.0	66.7	39.5	no	1	3	620
74	0.0	7.1	7.1	0.0	53.4	9.1	no	3	1	464
75	-	1.0	-	-	3.8	-	-	-	8	422
76	15.9	3.6	19.5	23.1	23.4	23.1	no	1	4	535
77	0.0	-	-	0.0	-	-	no	1	-	555
78	0.0	11.4	11.4	0.0	30.8	13.5	no	4	9	547
79	0.0	3.5	3.5	0.0	20.5	4.3	no	2	8	474
80	-	6.6	-	-	39.3	-	-	-	5	443
81	0.0	-	-	0.0	-	-	no	1	-	-
82	0.0	7.0	7.0	0.0	43.9	9.1	yes	6	5	634
83	26.1	5.9	32.0	47.4	47.2	47.3	yes	2	1	280
84	0.0	0.0	0.0	0.0	0.0	0.0	no	3	3	524
85	0.0	-	-	0.0	-	-	yes	1	-	-
86	0.0	0.0	0.0	0.0	0.0	0.0	no	2	4	549
87	19.6	-	-	19.0	-	-	no	5	-	-
88	-	0.0	-	-	0.0	-	-	-	2	456
89	49.8	-	-	87.7	-	-	no	1	-	-
90	15.5	-	-	55.9	-	-	no	1	-	-
91	-	7.3	-	-	43.4	-	-	-	3	576
92	0.0	0.0	0.0	0.0	0.0	0.0	no	1	8	516
93	11.7	0.0	11.7	13.5	0.0	11.4	no	1	1	338
94	40.4	0.0	40.4	69.2	0.0	68.3	no	1	1	1000
95	14.6	1.1	15.7	19.3	7.2	17.0	no	1	3	660
96	0.0	0.0	0.0	0.0	0.0	0.0	yes	1	2	718
97	-	0.0	-	-	0.0	-	-	-	9	1061

Farm No.	Total B.F. Production (lbs.)	B.F. Prodn. per Acre (lbs)	Effective Area (Acres)	B.F. Prodn. per Cow (lbs.)	Effective No. of Cows	Type of Supply	Type of Contract	Investment per Cow (Owner)	Investment per Cow (S/M)	Investment per Cow Total	Date of Purchase	No. of Shed Units of Labour	No. of Full-time Labour Equivalents
99	24000	131.9 No Y.S.	182	227.5	105.6 95	C	½	89.4 ½	17.2 ½	105.6 ½	1916	½	½.00
99	13000	130.0	100	171.5	71.7	C	½	36.2 ½	-	-	1919	-	-
100	9800	127.3	77	154.3	63.6	C	¼	-	-	-	1937	-	-
101	-	-	170	-	94.4	C	½	35.3	-	-	1940	-	-
102	18706	152.4	84	242.9	62.7	C	½	-	17.0	-	-	1	-
103	10000	181.8	55	197.6	50.6	C	½	62.2	-	-	1922	-	-
104	-	-	-	-	76.0	C	½	-	24.3	-	-	½	-
105	14000	110.2	127	135.4	103.4	C	½	-	16.3	-	-	½	-
106	-	-	118	-	89.6	C	½	-	19.7	-	-	½	-
107	-	-	170	-	121.3	C	½	-	15.2	-	-	3	-
108	-	-	260	-	179.3	C	½	-	14.3	-	-	4	-
109	17672	182.2	97	263.4	79.1	D.M.	½	82.3	17.7	90.6	1940	½	2.04
110	18400	179.3	92	259.1	89.6	D.M.	½	87.6	-	-	1912	-	-
111	29000	250.0 No Y.S.	116	319.9	131.9 85	D.M.	½	72.1	19.4	92.5	1921	4	3.62
112	13495	155.3	119	206.1	95.7	D.M.	½	66.0	16.7	82.7	1939	3	2.84
113	11000	84.7	130	166.6	92.3	D.M.	½	100.5	-	-	1943	-	-
114	15571	155.7	100	194.5	94.4	D.M.	½	101.9	26.4	129.3	1927	½	1.76
115	24300	144.6	169	209.5	116.0	D.M.	½	59.7	13.1	72.8	1940	3	½.75
116	-	-	117	-	96.9	D.M.	½	70.3	-	-	1910	-	-
117	17982	142.7	126	200.5	89.7	D.M.	½	87.5	21.8	99.3	1933	½	2.11
118	22761	208.9 No Y.S.	110	239.9	94.9 85	D.M.	½	92.9	20.0	108.8	1934	3	2.39
119	26802	137.4	195	211.7	126.6	D.M.	½	89.3	-	-	1936	-	-
120	23746	189.9	125	244.5	97.1	D.M.	½	-	23.7	-	-	½	-

o The figure inside the circle indicates the number of farms to which the data in the particular line applies.

* Estimate

\- Data either not collected or not reliable

No Y.S. No replacements reared on the property. The figure above the effective number of cows for the same farm is an estimate of the numbers that would be carried if young stock were reared.

0 Zero

Farm No.	Capital Indebtedness per Cow (Owner) £	Capital Indebtedness per Cow (S/M) £	Capital Indebtedness per Cow (Total) £	% Capital as Mortgage (Owner)	% Capital as Mortgage (S/M)	% Capital (Total as Mortgage	Resident on Farm or not (Owner)	Number of Farms Owned	Number of Years on Farm (S/M)	Family Income (S/M) £
98	0.0	0.0	0.0	0.0	0.0	0.0	no	4	14	811
99	28.2	-	-	35.9	-	-	no	3	-	-
100	-	-	-	-	-	-	no	3	-	-
101	9.4	-	-	11.2	-	-	no	1	-	-
102	-	0.0	-	-	0.0	-	-	-	3	489
103	0.0	-	-	0.0	-	-	no	1	-	-
104	-	0.0	-	-	0.0	-	-	-	5	432
105	-	4.9	-	-	29.5	-	-	-	4	427
106	-	0.0	-	-	0.0	-	-	-	5	354
107	-	0.0	-	-	0.0	-	-	-	2	864
108	-	10.0	-	-	69.9	-	-	-	2	899
109	27.3	1.3	28.6	45.4	7.3	35.5	no	1	4	775
110	0.0	-	-	0.0	-	-	no	1	-	-
111	0.0	0.0	0.0	0.0	0.0	0.0	no	1	4	1105
112	37.9	0.0	37.9	57.4	0.0	45.9	yes	1	2	472
113	24.3	-	-	24.2	-	-	no	2	-	-
114	29.4	0.0	29.4	27.9	0.0	22.1	no	6	5	434
115	25.9	0.0	25.9	45.4	0.0	35.6	no	4	2	732
116	5.9	-	-	5.4	-	-	no	1	-	-
117	30.1	2.2	32.3	44.7	10.0	36.2	no	1	4	1003
118	34.3	0.0	34.9	39.2	0.0	32.0	yes	1	4	757
119	0.0	-	-	0.0	-	-	no	1	-	-
120	-	0.0	-	-	0.0	-	-	-	6	774

A P P E N D I X IV.

AN ESTIMATE OF THE FARM OWNER'S AND THE SHARE-MILKER'S MANAGEMENT CHARGE AGAINST THE FARM.

APPENDIX IV

ESTIMATE OF THE FARM OWNERS' AND SHARE-MILKERS' MANAGEMENT CHARGE AGAINST THE FARM

In Section V all group comparisons were made on the basis of the management-reward. This figure, however, contains both a management charge against the farm and a pure profit. The latter is the residue left after all costs including the management charge have been deducted from the farm owner's or the share-milker's share of the gross income. A comparison made between groups of owners or between groups of share-milkers on this basis, willit is suggested, give a different result from a comparison of the group management-rewards. This section is appended so that this point may be expanded and clarified and so that the use of a management-reward comparison may be justified despite its weaknesses.

During the greater part of the period under the survey the labour and management-reward of the guaranteed price was 11.44d. per lb. B.F. and the award wage was five guineas per week, (£273 a year). If the total labour and management-reward be calculated for farms of different sizes (different outputs of B.F.), it is seen that there is some small excess of the total reward over and above the £273 per 6,000 lbs. B.F. labour reward: e.g. with an output of 6,000 lbs. B.F. the labour reward is £273 but the total reward (6000 x 11.44d.) is £286. The surplus of £13 is the management charge against the farm. If the output is 12000 lbs. B.F. the surplus is £26, or 10/- a week, and so on for various scales of production. (Table 41).

Table 41. Management charge in relation to size of output.

Output lbs. B.F.	Labour and Management Income	Labour Reward	Management Reward
	£	£	£
6,000	286	273	13
12,000	572	546	26
18,000	858	819	39
24,000	1,144	1,092	52
30,000	1,430	1,365	65
36,000	1,716	1,638	78

This means that with owner-manager farms, the farm owner can hire labour to do all the farm work and he will receive the balance as a management-reward. Under a system of share farming, however, the division of the guaranteed price income between the farm owner and the employee is not so straight forward. On this type of farm, leaving aside any considerations of the extra labour charges (p...), the amount of management exercised by the farm owner varies with the nature of the contract and his place of residence (Section V). Furthermore the share-milker in many cases performs managerial duties, and, as a result, is entitled to some share of the management income of the farm.

It is suggested that the relative amounts of managerial supervision could be somewhat as set out as in Table 42. This table implies that if, e.g. the production of a farm is 24,000 lbs. B.F., and the contract 1/3 share and the owner resident on the farm, then the owner should get 75% (£39) of the management income. The sharemilker would get the remaining £13.

Table 42. Percentage Allocation of Management Income between Owner and Share-milker.

	Resident Owner		Non-resident Owner	
Contract	Owner	S/M	Owner	S/M
1/4 (plus 10%)	100%	0	90%	10%
1/3 (plus 10%)	75%	25%	50%	50%
1/2	25%	75%	10%	90%

If this theme is carried out to completion then the correct way to compare groups of farms would be on the basis of the average pure profit. The pure profit is the management reward (defined p...) minus the share of the management charge against the farm: e.g. if the owner's management reward for the resident owner example just quoted was £350 his pure profit would be £311. This figure £311 is completely free, therefore, of any unpaid costs and, if used, would give a truer figure for group comparisons. The disadvantage of using the pure profit as a comparative figure is that it (a) tends to be rather arbitrary and depends upon the accuracy of Table 42 for its reliability. (b) tends to be too large a figure for a particular output. There is no doubt that the management charge calculated in Table 41 is too low for the output to which it applies. Probably a more realistic figure would be three times as large. The difficulty, however, in making a higher management charge against the farm, is that on the smaller farms such a charge would result in a great negative management-reward figure than at present obtained. This would happen even if the management charge were proportional to the output of the

farm. For these two reasons comparisons have been made of the management-reward and not pure profit. In comparison with the example quoted above, if on the same farm the owner was non-resident then his share of the management income would be only one half of £52. This would increase the pure profit from £311 to £324 because a smaller share of the management-reward was earned by his own application. The effect of correcting the management-reward to a pure profit in this way would be to lower the resident owner's comparison figure relative to the non-resident owner's. It would also lower the quarter share owner's comparison figure relative to the third-share owner's and this again would be lower than the average of the half-share owner's group. In all cases the share-milker's group average comparitive figure would be affected in the reverse way as is shown by a combination of Tables 41 and 42. The foregoing is not an attempt to solve the problem of an equitable management-reward for farms; that would involve considerably more space and time than is at present warranted. It is merely an attempt to indicate some of the errors inherent in group comparisons of the management-reward, and an attempt to illustrate the difficulties involved in the elimination of these errors.

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A P P E N D I X V.

EXAMPLES OF STATISTICAL METHODS USED.

"t" Test of Significance of Difference Between Means

Size of herd - by type of contract

x 1/3 S/M. Farms.	x
-2.0	+9.6
-3.0	+2.3
-9.3	-6.2
-50.5	+0.2
-51.5	+19.1
-1.6	18.3
+30.3	-7.2
-16.7	-41.0
-13.8	+17.0
-22.9	+25.4
-6.2	+32.9
+11.7	+82.9
+0.2	+30,9
+61.3	-45.2
-33.6	-23.3
-28.3	-0.9
+9.6	+50.3
+19.1	+9.6
-32.6	+11.9
+0.2	+35.0
+29.7	-17.8
+7.5	-29.3
+10.7	-7.2
+9.3	-12.5
-17.8	+19.1
+25.2	-18.8
+2.3	-1.8
+24.3	
-16.7	
+30.4	
-17.8	
-2.0	
+17.8	

1/3 S/M farms

$\bar{x}$ = 96.9 n = 59

Sx^2 = 50529.92

$s = \sqrt{\frac{50529.92}{58}} = \sqrt{871.2}$

s = 29.5

$s_s = \frac{29.5}{\sqrt{2(59)}} = \frac{29.5}{10.9}$

$s_s = \pm 2.7$

1/2 S/M Farms.	
-6.0	-29.3
-14.5	+15.1
-2.9	+2.4
+5.6	-31.4
+23.5	-13.4
-20.8	-29.3
-10.3	+7.7
-13.7	+12.9
-2.9	+44.6
+2.4	-8.2
+9.3	-31.4
-38.8	-9.2
-13.4	+41.4
-12.4	+5.1
-32.4	-2.9
-29.3	+21.4
-13.4	+11.9
+49.9	-18.7
+7.7	-1.4
+8.7	-1.4
-18.7	-1.4
+0.3	-1.4
-11.3	-1.4
+1.3	+30.3
+44.6	+30.0
-18.7	+2.4
+49.9	-6.0
+2.4	-12.4
+34.0	+39.3
+9.3	+97.3
+12.9	
-39.8	
-39.8	

½ S/M farms

$\bar{x}$ 92.0

n = 63

Sx^2 39553.38

$s = \sqrt{\frac{39553.38}{62}} = \sqrt{637.95}$

= 25.2

$s_s = \frac{25.2}{\sqrt{2(63)}} = \frac{25.2}{11.2}$

$s_s = \pm 2.25$

"t" test of differences between mean herd sizes.

$t = \frac{d}{s/\sqrt{n}}$

$= \frac{96.9 - 92.0}{\sqrt{\frac{50529.92 + 39553.38}{58 + 62}} \sqrt{\frac{1}{59} - \frac{1}{63}}}$

$= \frac{14.9}{\sqrt{\frac{90083.3}{120}} \sqrt{\frac{1}{59} - \frac{1}{63}}} = \frac{14.9}{750.7\sqrt{.017 + .016}}$

$= \frac{14.9}{\sqrt{750.7}\sqrt{.033}} \qquad \frac{14.9}{\sqrt{750.7 \times .182}}$

$= \frac{14.9}{\sqrt{27.59 \times .182}} \qquad = \frac{14.9}{\sqrt{3.02}}$

"t" = 4.6 H.S. (the 1% level of "t" for n = 120 is 2.616)

Correlation between average butterfat payment in the year of purchase and investment per cow at the time of the survey when the "time lag" (section III) is 18 months. Also correlation between payout and transfers of land when the time lag is 18 months. In all cases the data are reduced to five year end-point moving averages.

Year	B.F. pence	Land transfers (000)	Investment per cow £
	X	Y'	Y
1915			
1916			
1917			
1918	- - -	36.3	82.5
1919	18.26	42.3	100.6
1920	19.50	54.1	104.5
1921	22.73	59.3	97.9
1922	22.63	63.4	92.6
1923	-	-	-
1924	21.42	68.6	90.2
1925	21.35	67.6	86.0
1926	21.07	60.2	86.9
1927	17.55	58.5	89.9
1928	17.65	55.7	91.4
1929	17.60	52.4	93.3
1930	17.05	46.3	95.9
1931	15.78	39.3	88.7
1932	15.01	32.9	88.0
1933	13.30	27.7	85.0
1934	11.44	22.9	78.9
1935	10.14	21.1	72.6
1936	10.12	22.3	72.6
1937	10.54	24.1	70.8
1938	11.77	26.5	75.4
1939	12.23	28.0	77.2
1940	14.57	28.8	79.2
1941	15.37	29.0	81.8
1942	15.86	29.0	85.1
1943	16.19	29.7	82.4
1944	16.50		

(5 year moving average end point scale)

(a) Payout and investment per cow

$n = 24$

$SX = 390.11$ $SY = 2066.8$

$SX^2 = 6669.99$ $SY^2 = 179858.64$

$\frac{(SX)^2}{n} = 6341.08$ $\frac{(SY)^2}{n} = 177985.92$

$sx^2 = 328.91$ $sy^2 = 1872.72$

$SXY = 34156661$

$\frac{(SX)(SY)}{n} = 33594972$

$sxy = 561.689$

$r = \frac{561.69}{\sqrt{615956.3352}}$

$= \frac{561.69}{\sqrt{784.82}}$

$r = .715 \pm .102$ H.S.

(the 1% level of r for n = 24 is .505)

(b) Payout and transfers of land

$SX = 390.11$ $SY' = 989.2$

$SX^2 = 6669.99$ $SY'^2 = 46812.44$

$\frac{(SX)^2}{n} = 6341.08$ $\frac{(SY')^2}{n} = 40771.53$

$sx^2 = 328.91$ $sy^2 = 6040.91$

$SXY' = 17396217$

$\frac{(SX)(SY')}{n} = 16079033$

$sxy' = 1317.184$

$r = \frac{1317.184}{\sqrt{1986915.7081}}$

$= \frac{1317.18}{1409.57}$

$r = .934 \pm .024$ H.S.

(The 1% level for r where n = 24 is .505)

The standard error of r was determined from the following formula

$$s_r = \frac{1 - r^2}{\sqrt{N - 1}}$$

OUTPUT PER FULL TIME LABOUR EQUIVALENT IN LBS. BUTTERFAT

Analysis of variance

(a) classification by type of contract.

Total N = 75

SX = 667487

SX^2 = 6287999250

C = 5940518000

SX^2 = 347,480,250

Between Groups

$$= \frac{(A)^2}{n} + \frac{(I/S)^2}{n} + \frac{(S)^2}{n} - C$$

$$= \frac{(32853)^2}{4} + \frac{(381196)^2}{41} + \frac{(253441)^2}{50} - C$$

= 5954003000

$$\frac{5940518000}{13,485,000}$$

Source of Variance	df	SS	MS	F	Sign
Total	74	347,480,250			
Between Groups	2	13,485,000	6,742,500	1.45	N.S.
Within Groups	72	333,995,250	4638822		

(b) classification by type of supply

Total SX^2 = 347,480,250

Between Groups = $\frac{(B)^2}{n} + \frac{(C)^2}{n} + \frac{(DM)^2}{n} - C$

$$\frac{(177849)^2}{20} + \frac{(128853)^2}{14} + \frac{(360785)^2}{41} - C$$

5942224800

$$\frac{5940518000}{1,706,800}$$

Source of Variance	df	SS	MS	F	Sign.
Total	74	347,480,250			
Between Groups	2	1,706,800	853,400		N.S.
Within Groups	72	345,780,450	4802,547	5.6*	H.S.

* Variation within each group is significantly greater than variation between groups.

OUTPUT PER FULL TIME LABOUR EQUIVALENT IN LBS. BUTTERFAT

Subclass analysis of variance Three types of supply; ½ and 1/3 share farms

(a) Preliminary analysis

Total

$N = 71$

$SX = 654654$

$SX^2 = 6091783001$

$C = 5672680000$

$SX^2 = 419,103,001$

Between Groups

$$= \frac{(B)^2}{n} + \frac{(C)^2}{n} + \frac{(DM)^2}{n} - C$$

$$= \frac{(389894)^2}{38} + \frac{(166887)^2}{19} + \frac{(128853)^2}{14}$$

$= 5674136800$

5672680000

$1,456,800$

Source of Variance	df	SS	MS	F
Total	71	419,103,001		
Between Groups	5	1,456,800	291,360	N.S.
Within Groups	66	417,646,201	6,327,972	

$$\frac{1}{K} = \frac{1}{6}\left(\frac{1}{15} + \frac{1}{6} + \frac{1}{7} + \frac{1}{7} + \frac{1}{21} + \frac{1}{17}\right)$$

$= .167\ (.076 + .167 + .142 + .142 + .047 + .058)$

$= .167 \times .632 = .105$

Error term = 6,327,972 x .105 = 664,457

(b) Subclass analysis

	B	C	DM	SX	SX^2
1/3	9605	8426	9992	28023	263093565
½	8069	9558	9416	26043	227296181
SX	17674	17984	19408	54066	
SX^2					490386746

Subclasses $= 490386746$

487138700

$3,248,046$

Between supply

$$= \frac{(B)^2}{2} + \frac{(C)^2}{2} + \frac{(DM)^2}{2} - C$$

$= 487624490$

487138700

$485,790$

Between contract

$$= \left(\frac{1}{2}\right)^2 + \left(\frac{1}{3}\right)^2 - C$$

$$= 487842100$$

$$487188700$$

$$653400$$

Source of Variance	df	SS	MS	F	Sign.
Subclasses	5	3,193,046			
Between Contract	1	135,790	135,790		N.S.
Between supply	2	653,400	326,700		N.S.
Interaction	2	2,403,856	1,204,428	1.81	N.S.
Error term	69		664,437		

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