

# STATISTICAL AND SOCIAL INQUIRY SOCIETY OF IRELAND.

## FINANCIAL RESULTS ON MIXED DAIRY FARMS IN 1937-'38.

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In May, 1938, an enquiry was started by the Department of Dairy Accountancy and Economics, University College, Cork, into the costs and income of a number of dairy farms on the North Cork-Limerick border, about ten miles west of Charleville. The enquiry was designed to cover the two-year period, 1st May, 1937, to 30th April, 1939. This paper is intended to be a broad interim summary of portion of the data available for the first year—1st May, 1937, to 30th April, 1938.

The information was collected by the "survey" method which necessitated a personal visit to every farm included in the enquiry for the purpose of ascertaining the relevant data. The farmers concerned were not required to keep financial accounts specially for the purpose of the investigation. For all farms, however, the quantity and value of milk sold were obtained at the creamery and, for most of the farms, complete information concerning concentrates purchased and eggs sold were available from the same source. In many cases the costs of manures, threshing, crushing, etc., were verified from the accounts kept at the creamery.

The selection of the farms was, as far as the circumstances permitted, a random selection from the lists of suppliers available at the creamery. Farms under 10 and over 210 statute acres and farms which were not owned by the occupiers were omitted. The records obtained from 98 farms are included in this paper. All these farms were situated comparatively near one another, within a district roughly seven miles by three miles. Their distribution by size is shown in Table I.

TABLE I.—DISTRIBUTION OF FARMS ACCORDING TO SIZE.

Size of Farm (Statute Acres)	Number of Farms	Total Area (Acres)	Average Area per Farm (Acres)
Under 20 Acres ... ..	5	75	15
20—39·9 " ... ..	18	543	30
40—59·9 " ... ..	23	1,150	50
60—99·9 " ... ..	28	2,027	72
100—149·9 " ... ..	14	1,685	120
150— " ... ..	10	1,764	176
TOTAL ... ..	98	7,244	74

Although no two farms were exactly alike in economic organisation, or in the technique of production, still they all conformed, very closely, to a type of farming which is popularly described as "mixed" dairy farming. That is to say, milk-production was the key-stone of the farm-organisation, with a fairly substantial portion of the total income derived from pig and poultry production, and only a small portion from the sale of crops. A more complete picture of the type of farming which came under review will be obtained from subsequent Tables dealing with the financial results and the physical production.

The report is divided into five sections dealing with :—

1. The value of the total output, and its division as between ordinary expenses and the remuneration of labour (hired and family).
2. The extent and composition of the labour force on the farms.
3. The remuneration of the workers (*a*) per farm and (*b*) per person.
4. The nature of the principal items of expenditure other than labour, and their relative importance.
5. The extent and organisation of the physical factors of production, which, through the medium of the then existing price-structure, produced the financial results dealt with in the previous sections.

The basis on which the essential valuations of opening and closing stocks, produce consumed in the farmers' homes, etc., were made, is briefly set out in an appendix.

In order to facilitate examination and interpretation of the data available, Tables have been extensively employed, and comment has been restricted to what seemed to be the minimum essential to the clarification of the Tables.

## 1. TOTAL OUTPUT.

Table II shows (*a*) the value of the different items which made up the total output, and (*b*) the value of that portion of the total output which was consumed in the farmers' homes. Throughout this paper, output refers only to the surplus available on the farms for disposal, either in the form of sales off the farm, or of consumption in the farmers' homes. No account is taken of that portion of the total production which was used on the farm for further production. The term "sales" represents, in the case of live-stock, nett sales (*i.e.*, after deduction of purchases) and includes the customary adjustment for the value of stocks on hands at the beginning and end of the financial period under review. Heifers transferred into the dairy herd during the year have been credited, as if they had been sold, to the "other cattle" account, and have been debited, as if they had been purchased, to the "cows" account. This arrangement has been adopted so as to ensure reasonable uniformity in the treatment of the cost of herd-maintenance as between farms on which essential replacements of dairy cows were made with home-bred heifers and those on which the herds were kept at normal level by means of purchased cows.

TABLE II.—(a) OUTPUT AND (b) CONSUMPTION IN FARMERS' HOMES\*

Product	OUTPUT		Consumed in Farmers' Homes		
	Value	As Percentage of Total Output	Value	As Percentage of Item in Second Column	As Percentage of Total Output
	£	%	£	%	%
Milk (New) ...	16,866.75	46.4	841.65	5.0	2.3
Milk (Sep.) ...	152.30	0.4	70.65	46.0	—
Calves ...	5,602.05	15.4	—	—	—
Cattle ...	1,501.45	4.1	—	—	—
Horses... ..	325.70	0.9	—	—	—
Pigs ...	6,250.75	17.2	1,078.35	17.3	3.0
Poultry ...	3,368.90	9.3	1,561.10	46.3	4.3
Crops ...	2,208.05	6.1	1,094.90	49.6	3.0
Sundries ...	65.75	0.2	13.75	20.9	—
<b>TOTAL OUTPUT</b>	<b>36,341.70</b>	<b>100</b>	<b>4,660.40</b>	<b>12.8</b>	<b>12.8</b>

\* This does not include butter (which was bought at the creamery).

This Table indicates the important position which milk, as a source of income, occupied on these farms. Separated milk, calves, and cattle are a direct by-product of milk-production. It may, therefore, be reasonably said that the dairy herd contributed about two-thirds of the total output on these farms.

Pigs at 17.2 per cent., and poultry at 9.3 per cent., were the next most important sources of income. As the intensity of production in the case of these two products tends to be closely correlated, in this country, with intensity of milk-production, they are usually looked upon as indirect by-products of dairying. On this basis, therefore, it would be roughly true to say that over 90 per cent. of the total output resulted from milk-production.

The Table indicates, also, the extent to which the farmer and his family constituted a direct market for the farm-output. The farmers' households consumed, in the form of "liquid" milk, 5 per cent. of their total output of milk, 17.3 per cent. of their total pig production, 46.3 per cent. of their total poultry production, and 49.6 per cent. of their disposable surplus of crops. On the average, nearly thirteen per cent. of the total output was used in the farmers' homes. Alternatively, the system of agriculture practised on these farms might be described as "commercialized" to the extent of about eighty-seven per cent.

That there was no very significant change in the relative importance of the output of different products, according as size of farm changed, is indicated by the following Table, which shows, for the different size-groups, the ratio of the output of each product to the total output.

TABLE III.—OUTPUT OF DIFFERENT PRODUCTS AS PERCENTAGE OF TOTAL OUTPUT, BY SIZE OF FARM.

Products	All Farms	Under 20 Acres	20-39.9 Acres	40-59.9 Acres	60-99.9 Acres	100-149.9 Acres	150- Acres
Milk (New) ...	46.4	46.7	46.2	47.6	47.0	46.3	47.0
Milk (Sep.) ...	0.4	0.6	0.4	0.6	0.3	0.3	0.3
Calves ...	15.4	9.0	11.9	14.6	14.8	17.1	14.8
Other Cattle ...	4.1	2.3	0.9	2.1	2.6	7.5	2.6
Horses ...	0.9	—	—	0.7	0.8	1.9	0.8
Pigs ...	17.2	20.8	20.6	18.1	18.8	13.0	18.8
Poultry and Egg ...	9.3	15.2	12.7	11.3	8.8	8.3	8.8
Crops.. ...	6.1	4.8	7.2	4.8	6.8	5.5	6.8
Sundries ...	0.2	0.6	0.1	0.2	0.1	0.1	0.1
TOTAL OUTPUT	100	100	100	100	100	100	100
Consumption in farmers' houses as percentage of total output	12.8	20.3	16.6	13.9	12.8	11.5	10.1

In the size-group 100-150 acres, the output of calves and other cattle was at a higher relative level, and the output of pigs was at a lower relative level, than in any of the other size-groups. The comparative importance of poultry declined noticeably on the farms over 60 acres, owing to the fact that size of farm was not the essential factor in determining the size of the poultry flocks.

The value of that portion of the total output that was consumed in the farmers' homes decreased from 20 per cent. in the smallest size-group to 10 per cent. in the largest size-group. The value of this item, per farm, appears in a subsequent Table.

The following Table shows (a) the relation between the total output and the expenses and (b) the total amount available as remuneration for the workers.

TABLE IV.—PROPORTION OF OUTPUT AVAILABLE FOR LABOUR.

Size of Farm	OUTPUT			Expenses excluding Cost of Labour	Total available for Labour (Hired and Family)	Amount available for Labour as percentage of Total Output
	Sales	Consumed in Farmers' Homes	Total			
	£	£	£	£	£	%
Under 20 Acres	648.50	165.15	813.65	326.30	487.35	60
20-39.9 „ ...	3,224.35	641.60	3,865.95	1,839.65	2,026.30	52
40-59.9 „ ...	5,409.45	872.75	6,282.20	2,919.50	3,362.70	54
60-99.9 „ ...	9,985.85	1,470.10	11,455.95	5,241.10	6,214.85	54
100-149.9 „ ...	6,432.15	838.90	7,271.05	3,163.70	4,107.35	56
150- „ ...	5,981.00	671.90	6,652.90	3,138.95	3,513.95	53
ALL FARMS ...	31,681.30	4,660.40	36,341.70	16,629.20	19,712.50	54

Except in the case of farms under 20 acres, the proportion of the total output which was available for the remuneration of all the workers—hired and family—was very uniform at about 54 per cent.

Table V shows (a) the value of the produce consumed in the farmers' homes on a per-farm basis, and (b) the output, expenses and amount available for labour per acre.

TABLE V.

Size of Farm	Output per Acre	Expenses excluding Cost of Labour per Acre	Amount available for Labour per Acre	Output per Farm	Value of Produce consumed in Farmers' Homes per Farm
	£	£	£	£	£
Under 20 Acres ...	10.85	4.35	6.50	162.73	33.03
20-39.9 „ ...	7.12	3.39	3.73	214.78	35.64
40-59.9 „ ...	5.46	2.54	2.92	273.14	37.95
60-99.9 „ ...	5.65	2.59	3.06	409.14	52.50
100-149.9 „ ...	4.32	1.88	2.44	519.36	59.92
150- „ ...	3.77	1.78	1.99	665.29	67.19
ALL FARMS ...	5.02	2.30	2.72	370.83	47.56

## 2. LABOUR.

Before proceeding to show how that portion of the total output that was available for labour was divided between the hired workers and the family workers, it is desirable to indicate—

- (a) the number of persons, excluding hired workers, living on these farms during the account-period;
- (b) the extent and nature of the labour contributed by the family-workers;
- (c) the number of hired workers employed.

Table VI shows the number of persons, other than hired workers, living on the farms during the year in question. Children who were employed in non-agricultural occupations, but who lived at home, and children who were employed by other farmers, are not included. Children who were at boarding-schools are also omitted, although, for three or four months of the year, they lived on the farm. Two owner-occupiers who had part-time employment off the farm are included.

In rural districts, children usually leave the National Schools when they are about fourteen years of age. At about that age, too, on many farms, children begin to be able to contribute to the ordinary work on the farm, particularly to the less laborious types of work, e.g., caring for calves, pigs, and poultry, carting milk to the creamery, milking cows and light harvest-work. In this table, accordingly, the persons living on the farms were divided according as they were under or over 14 years, and according as they were males or females, so that the picture of the reservoir of family-labour might be as comprehensive as possible.

TABLE VI —NUMBER IN HOUSEHOLDS, EXCLUDING HIRED WORKERS

Size of Farm	MALES		FEMALES		TOTAL PERSONS			NUMBER OF PERSONS	
	Over 14	Under 14	Over 14	Under 14	Over 14	Under 14	All Ages	Per Farm	Per 100 Acres
Under 20 Acres	6	3	10	3	16	6	22	4·40	29
20—39·9 "	28	11	26	7	54	18	72	4·00	13
40—59·9 " ...	41	9	36	7	77	16	93	4·00	8
60—99·9 "	52	11	47	9	99	20	119	4·30	6
100—149·9 "	21	6	22	1	43	7	50	3·60	3
150—	16	9	19	9	35	18	53	5·30	3
ALL FARMS	164	49	160	36	324	85	409	4·20	6

The number of persons per 100 acres decreased according as farm-size increased, and for all farms the average was six. The farms in the size-groups under 40 acres were much more densely populated than those in the size-groups over 40 acres. The decrease in the number of persons per 100 acres began to be very pronounced at the 40 acre mark.

A more practical picture of the population, from the point of view of the subsequent tables, is given by the column showing the number of persons per farm. In this respect, there was comparative uniformity in all size-groups, at, say, four or five persons per household.

Of the 324 persons shown as being over 14 years of age, twelve were rather elderly people, from whom effective contributions of work could not be legitimately expected. There were, accordingly, 312 persons—161 males and 151 females—who were capable of working on these farms—an average of 3·2 "potential" workers per farm, as compared with an average of 4·2 persons per farm.

Table VII shows, in terms of "units" of labour, (a) the number of these "potential" family-workers who contributed to the farm-work, and (b) the number of hired workers employed. In this, and in the subsequent tables, a "unit" of labour represents the equivalent of an adult working, full-time, for a complete year, e.g., a casual worker employed for one month, is equated to one-twelfth of a "unit."

TABLE VII.—TOTAL UNITS OF HIRED AND FAMILY LABOUR, BY SIZE OF FARM

Size of Farm (Acres)	FAMILY LABOUR (Units)		HIRED LABOUR (Units)		TOTAL LABOUR (Units)		Family Labour as Percentage of Total Labour (%)	Male Labour as Percentage of Total Labour (%)
	Male	Total	Male	Total	Male	Total		
Under 20	4·05	6·05	1·57	1·57	5·62	7·62	79	74
20—39·9	23·83	31·30	4·76	4·83	28·59	36·13	87	79
40—59·9	31·58	42·16	10·36	11·47	41·94	53·63	79	78
60—99·9	44·13	54·69	24·95	28·78	69·08	83·47	66	83
100—149·9	19·00	24·99	19·29	23·34	38·29	48·33	52	79
150	13·67	17·42	18·48	20·89	32·15	38·31	45	84
ALL FARMS	136·26	176·61	79·41	90·88	215·67	267·49	66	81

As a rough summary, it might be said that about 85 per cent. of the male members of these families were in full-time employment, on the farms, and that the female members devoted about 27 per cent. of their time to farm-work.

Sixty-six per cent. of the total labour employed was family labour. On the farms in the size-groups under 60 acres, the family supplied practically all the labour required. By comparison, the ratio of family labour on the farms over 60 acres decreased considerably, but even, in the largest size-group, it was still comparatively high at 45 per cent.

The ratio of male to female labour was about the same for all size-groups, and the figures 4 : 1 may be taken as representative. Most of the female labour was employed in milking cows, caring for pigs, poultry, and calves, etc.—“farm-yard” work—and very little “field” work was done by females.

A more practical picture of the labour force, and one which better represents the view-point of the individual farmer, is provided by Table VIII, which shows the quantity of labour per farm employed in the different size-groups.

TABLE VIII.—LABOUR UNITS (a) PER 100 ACRES AND (b) PER FARM

SIZE OF FARM (Acres)	TOTAL LABOUR UNITS PER 100 ACRES			FAMILY LABOUR UNITS PER FARM		HIRED LABOUR UNITS PER FARM		TOTAL LABOUR UNITS PER FARM			Hired Male Labour as Percentage of Total Hired Labour %
	Family	Hired	Total	Male	Female	Male	Female	Family	Hired	Total	
Under 20	8 07	2 09	10 16	0 81	0 40	0 31	—	1 21	0 31	1 52	100
20—39·9	5 76	0 89	6 65	1 32	0 42	0 26	0 01	1 74	0 27	2 01	99
40—59·9	3 66	1 00	4 66	1 37	0 46	0 45	0 05	1 83	0 50	2 33	90
60—99·9	2 70	1 42	4 12	1 57	0 38	0 89	0 14	1 05	1 03	2 08	87
100—148·9	1 48	1 39	2 87	1 36	0 43	1 38	0 28	1 79	1 66	3 45	83
150—	0 99	1 18	2 17	1 37	0 37	1 85	0 24	1 74	2 09	3 83	88
All Farms	2 44	1 26	3 70	1 39	0 41	0 81	0 12	1 80	0 93	2 73	87

As the quantity of family-labour available per farm is not determined by size of farm, the family labour was comparatively uniform on all size-groups (ignoring the group under 20 acres, where special circumstances, in this respect, existed). The increase in the total labour-force, which increase in size of farm demanded, was almost entirely contributed by hired labour, and, from 60 acres upwards, the increase was very pronounced. An increased demand existed for hired female as well as for hired male labour, according as farm-size increased.

### 3. REMUNERATION OF LABOUR.

The following table shows how that portion of the total output, which remained over after expenses other than labour costs had been met, was divided. The information is given (a) on a “per farm” basis so as to throw into relief the position as it might be viewed by the farmer as an individual, and (b) on a “per unit of labour” basis so as to give the picture from the point of view of the community as a whole.

TABLE IX — AMOUNT AVAILABLE FOR LABOUR, (a) PER FARM, (b) PER UNIT OF LABOUR  
(IN £)

Size of Farm (Acres)	Amount available for Hired and Family Labour per Farm	Cost of Hired Labour per Farm	Amount available for Family Labour per Farm	Amount available for Hired and Family Labour per Unit	Cost of Hired Labour (Male and Female) per Unit	Amount available for Family Labour per Unit	Amount available for all workers, if value of Produce consumed in Farmers' Homes were excluded	
							Per Farm	Per Unit of Labour
Under 20	97.47	17.63	79.84	63.96	56.15	65.98	64.44	44.91
20—39.9	112.57	13.74	98.53	56.08	51.22	56.83	76.93	38.33
40—59.9	146.20	31.86	114.34	62.70	63.89	62.38	108.26	46.43
60—99.9	221.96	67.04	154.92	74.46	65.22	78.90	169.46	56.84
100—149.9	293.38	109.68	183.70	84.99	65.79	102.32	233.46	67.63
150—	351.40	143.92	207.48	91.72	68.89	119.11	284.21	74.19
ALL FARMS	201.15	60.41	140.74	73.69	65.14	78.09	140.74	56.27

The amount available *per farm* as wages for all workers, whether hired or family, ranged from approximately £1 17s. 0d. per week to £6 15s. 0d. per week, assuming that the produce used in the house had been sold to the farmer at farm-prices. If the value of the produce consumed in the farmers' homes were excluded, the weekly income available *per farm* for all workers would have ranged from about £1 5s. 0d. per week to about £5 9s. 0d. per week.

The average weekly remuneration *per unit of labour* varied from about 22 shillings to 35 shillings per week, according to size of farm.

Excluding the value of the produce consumed in the house, the income available *per unit of labour* ranged from about 15 shillings to 29 shillings per week.

Table VIII showed that according as the farm-size increased, the number of workers per farm increased. Table IX shows that, according as the size of farm increased, the amount available per worker employed increased. It was only on farms from 60 acres upwards that any appreciable difference existed between the rate of wages that was actually paid to the hired workers and the rate that could have been paid to the family workers. In fact the 100 acre mark was passed before the difference was of practical significance.

The minimum rate of wages payable to hired male workers in agriculture is now determined by statute. But no definite standard of remuneration has been laid down, even by convention, in the case of family workers. It seems to be generally agreed, however, that the amount available on a farm, after all expenses, including the cost of hired labour, have been paid, should be sufficient (a) to enable the family-workers to receive a higher rate of wages than the hired workers, because the work which they do, is held to be superior both in quality and quantity, to that done by hired labour; (b) to give to the farmer a still further remuneration for his functions as a manager, and in particular, as a risk-taker, and (c) to allow a reasonable rate of interest on the capital which he has invested in his farm as a business undertaking.

I am not prepared to give an opinion as to the exact amounts that



should be available under these three heads. I have given the number of family-workers engaged on these farms, and sufficient details concerning the scope of the farm-operations, to enable an opinion to be formed as to how far the amount available for the family per farm is sufficient to cover the extra costs of family labour, and of the managerial and risk-taking functions of the farmer. In the following table, the value of the farmers' investment on 1st May, 1937, in (a) livestock, (b) machinery and equipment, (c) farm-buildings, excluding dwelling houses, and (d) land, are set out. Livestock has been valued on the basis set out in the appendix. Machinery and equipment (which does not include sundry yard-utensils of small value) have been taken at their estimated replacement value, which, in most cases, is considerably less than their original cost, and is, in all cases, very much lower than the cost of similar equipment, if bought new to-day. Farm-buildings have been taken at the estimated value given by the farmers. I believe these estimates are reasonable. Land has been taken at an average value of £13 per acre. The average value of the land, as calculated, from the farmers' own estimates, was £12 4s. Od. per acre. Three farms which had been sold near the district shortly before the enquiry averaged about £14 per acre. I have, accordingly, taken the value at £13 per acre for the purpose of this paper.

TABLE X —VALUE OF LIVE-STOCK AND DEAD-STOCK AS ON 1ST MAY, 1937,  
BY SIZE OF FARM

LIVE OR DEAD-STOCK	SIZE OF FARM (ACRES)						ALL FARMS	
	Under 20	20- 39·9	40- 59·9	60- 99·9	100- 149·9	150-	Total	Per- centage
LIVE-STOCK	£	£	£	£	£	£	£	
Cows	396	2,220	3,924	6,384	4,392	3,660	20,976	13·6
Other Cattle	85	430	895	1,594	1,073	1,471	6,148	4·0
Pigs	29	179	307	395	172	137	1,219	0·8
Poultry	21	87	118	167	101	69	557	0·4
Horses, Mules, Asses	70	487	631	1,279	887	841	4,195	2·7
TOTAL LIVE-STOCK	601	3,403	5,875	9,819	7,225	6,172	33,095	21·5
DEAD-STOCK								
Machinery and Equipment	138	938	1,497	2,620	1,201	1,367	7,761	5·0
Farm Buildings	292	1,755	3,498	5,620	4,071	4,240	19,476	12·6
Land	975	7,059	14,950	26,351	21,905	22,932	94,172	60·9
TOTAL DEAD-STOCK	1,405	9,752	19,945	34,591	27,177	28,539	121,409	78·5
TOTAL LIVE- and DEAD-STOCK	2,006	13,155	25,820	44,410	34,402	34,711	154,504	100

The fixed assets, land, buildings, and equipment, account for nearly 79 per cent. of the total value of the assets on 1st May, 1937. Land was by far the most important at about 61 per cent. Buildings amounted to approximately 13 per cent., and equipment and machinery to 5 per cent. The ratio of these fixed assets to the total assets increased steadily from 70 per cent. in the case of the farms under 20 acres to 82 per cent. in the case of the farms over 150 acres.

The relative value of draught-animals was approximately the same on all size-groups, viz., 11-12 per cent. of the value of all livestock. The following table shows the relation between the value of the different

classes of livestock, and the total value of all livestock, excluding draught-animals.

TABLE XI:—VALUE OF DIFFERENT CLASSES OF LIVESTOCK AS A PERCENTAGE OF TOTAL LIVESTOCK, EXCLUDING DRAUGHT ANIMALS

Size of Farm	Cows	Other Cattle	Pigs	Poultry	Horses— Excluding Draught Animals	Total
	%	%	%	%	%	
Under 20 Acres	74.60	16.04	5.50	3.86	—	100
20—39.9 "	76.16	14.75	6.11	2.98	—	100
40—59.9 "	74.85	17.06	5.85	2.24	—	100
60—99.9 "	73.64	18.39	4.55	1.93	1.49	100
100—149.9 "	68.63	26.14	2.68	1.58	0.97	100
150	67.03	26.93	2.51	1.15	2.38	100
ALL FARMS	71.79	21.04	4.17	1.90	1.10	100

The decline in the relative value of cows on the farms over 100 acres is offset by the increase in the relative value of "other cattle." On farms under 100 acres, cows occupied practically the same relative position, and other cattle showed an upward tendency. In all size-groups, the relative value of pigs and poultry decreased, according as farm-size increased. In regard to poultry, reference to Table I will show that, for every £1 invested in the flock, the total output was £6. This was no mean achievement for a section of the livestock, which, on many farms, is looked upon more as a necessary nuisance, than as a potentially important contributor to the farm income.

Table XII summarizes the data already given, and shows the surplus available as (a) extra remuneration for family labour because of its superiority to hired labour, (b) remuneration for the risk-taking and managerial functions of the farmer, and (c) interest on capital. The cost of family labour has been charged only at the cost of equivalent hired labour.

TABLE XII:—FINANCIAL RESULTS, ASSUMING FAMILY LABOUR TO HAVE BEEN PAID AT THE SAME RATE AS EQUIVALENT HIRED LABOUR.

Size of Farm	Total available for all Labour (Hired and Family)	Cost of Hired Labour (including board and lodgings)	Cost of Family Labour if paid at same rate as equivalent Hired Labour	Surplus (+) or Deficit (—)	Surplus (+) or Deficit (—) per Farm
	£	£	£	£	£
Under 20 Acres	487 35	88.15	282.05	+ 17.15	+ 3.43
20—39.9 "	2,026.30	247.40	2,026.59	- 247.69	-13.76
40—59.9 "	3,362.70	732.85	2,713.84	- 83.99	- 3.65
60—99.9 "	6,214.85	1,877.05	3,583.30	+ 754.50	+ 26.95
100—149.9 "	4,107.35	1,535.50	1,617.59	+ 954.26	+ 68.16
150—	3,513.95	1,439.20	1,203.89	+ 870.86	+ 87.09
ALL FARMS	19,712.50	5,920.15	11,527.26	+ 2,265.09	+ 23.11

If the small surplus in the size-group under 20 acres be ignored, it was only on the farms over 60 acres, when taken in groups, that anything was available to cover the extra payments that are generally agreed to be an essential part of a fair income for the farmer.

The average figures in this table, however, tend to conceal as much as they reveal. Accordingly, Table XIII has been constructed to show, in a general way, the number of farms in each size-group that had a surplus, and the amount of their surplus.

TABLE XII — DISTRIBUTION OF SURPLUS BY SIZE OF FARM.

SIZE OF SURPLUS £	Under 20 Acres	20-39·9 Acres	40-59·9 Acres	60-99·9 Acres	100-149·9 Acres	150- Acres	ALL FARMS	
							Number	Percentage Distribution
Under 20	1	4	2	5	1	—	13	21·4
20-39·9	—	2	4	2	2	1	11	18·0
40-59·9	1	2	2	4	1	1	11	18·0
60-79·9	—	1	1	2	2	2	8	13·1
80-99·9	—	—	—	2	2	1	5	8·2
100-119·9	—	—	—	1	1	1	3	4·9
120-139·9	—	—	1	1	1	—	3	4·9
140-159·9	—	—	—	2	—	2	4	6·6
160-179·9	—	—	—	—	1	1	2	3·3
180-199·9	—	—	—	—	1	—	1	1·6
	2	9	10	19	12	9	61	100
Per cent of Farms in each group showing Surplus	40	50	43	68	86	90	62	—

Roughly speaking, six out of every ten farms were able to pay to the family workers the same rate of wages as that paid to the hired workers, and to leave a surplus of some amount. In the size-groups under 60 acres, four to five out of every ten farms were in this position. Above 60 acres, the proportion of farms showing a surplus, increased from seven out of every ten, to nine out of every ten.

On the farms under 60 acres, with one exception, the surplus was less than £80. Approximately one-third of the farms between 60 and 99·9 acres had a surplus greater than £80; half of the farms in the size-group 100-150 acres, and slightly over half of the farms over 150 acres, had a surplus of £80 or over. On 70 per cent. of all farms showing a surplus, the amount was less than £80.

Ignoring the question of the necessity for giving family-workers a higher rate of wages than hired workers, and for allowing the farmer a payment for management, risk-taking, and interest on capital, the "employment capacity" of these farms during 1937/38, at the standard rates of wages for hired workers then prevailing, is indicated in Table XIV. The rate of wages, including National Health Insurance, for a full year, has been taken at £70, and the "employment capacity" has been calculated by dividing the total amount available for all workers by the rate of wages payable.

TABLE XIV :—"EMPLOYMENT CAPACITY" BY SIZES OR FARMS.

Employment Capacity (Units) of Labour	Under 20 Acres	20—39·9 Acres	40—59·9 Acres	60—99·9 Acres	100—149·9 Acres	150— Acres	All Farms
0·5 to 1·0	1	2	—	—	—	—	3
1·0 to 1·5	2	7	3	1	—	—	13
1·5 to 2·0	1	4	7	2	—	—	14
2·0 to 2·5	1	4	6	7	—	1	19
2·5 to 3·0	—	1	6	4	1	—	12
3·0 to 3·5	—	—	1	2	2	—	5
3·5 to 4·0	—	—	—	6	5	2	13
4·0 to 4·5	—	—	—	2	1	—	3
4·5 to 5·0	—	—	—	3	4	2	9
5·0 to 5·5	—	—	—	—	—	1	1
5·5 to 6·0	—	—	—	1	—	1	2
6·0 to 6·5	—	—	—	—	—	1	1
6·5 to 7·0	—	—	—	—	—	2	2
7·0 to 7·5	—	—	—	—	1	—	1
	5	18	23	28	14	10	98

## 4. OPERATING COSTS.

Table XV shows the relative importance of the principal items of operating costs, including the cost of labour. Family labour has been charged only at the cost of equivalent hired labour.

TABLE XV:—PERCENTAGE DISTRIBUTION OF ITEMS OF OPERATING-COSTS BY SIZE OF FARM

Items of Expenditure	All Farms	Under 20 Acres	20—39·9 Acres	40—59·9 Acres	60—99·9 Acres	100—149·9 Acres	150— Acres
	%	%	%	%	%	%	%
Rent and Rates	8·1	3·8	5·1	7·2	7·5	10·6	10·3
Concentrates ...	20·0	17·2	20·2	17·9	21·1	18·5	22·3
Hay, Roots, etc.	1·2	8·1	2·5	1·5	0·8	0·6	0·2
Herd Replacement	4·9	1·9	4·1	4·2	4·6	6·1	5·9
Repairs and Depreciation ...	5·1	4·3	4·9	5·7	5·1	4·6	5·1
Manures ...	1·9	0·7	1·5	1·8	2·2	1·6	2·2
Miscellaneous ...	7·6	4·9	6·4	7·6	7·7	8·1	8·3
Total above Items ...	48·8	40·9	44·7	45·9	49·0	50·1	54·3
Hired Labour .	17·4	11·1	6·0	11·5	17·5	24·3	24·9
Family Labour ...	33·8	48·0	49·3	42·6	33·5	25·6	20·8
Total Labour	51·2	59·1	55·3	54·1	51·0	49·9	45·7
TOTAL	100	100	100	100	100	100	100

Except in the case of concentrates and manures, the costs were essentially of an "over-head" nature. Their effects, therefore, on the labour income could be reduced mainly by increasing the turn-over. The high expenditure on hay, roots, etc., in the case of the smaller size-groups, as compared with the larger size-groups, indicates the extent to which these smaller types of farms were not self-sufficing in the basic farm-produced foods for their livestock. Hay was the principal farm-produced food that had to be purchased, and the necessary supplies

were obtained from farms that were not fully-stocked. Expenditure on manures was not a relatively significant item of cost, although the opposite might be expected on farms where hay and grass occupied such an important place. About half the costs under the heading—"Repairs and Depreciation"—was represented by depreciation which, of course, had not actually been paid for in the year in question, but which has to be accounted for at some time in the life of the farmer.

On the farms under 100 acres, concentrates and labour combined amounted to over 70 per cent. of the total costs. Labour at over 50 per cent. was, on most farms, by far the most important of all the items of expenditure. As family labour, especially on the farms under 60 acres, constituted the greater portion of the labour force, and as the quantity of family-labour cannot be easily and quickly adjusted to economic conditions, the element of rigidity in the operating-costs was very great.

Previous tables have shown the pivotal position occupied by milk-production and its direct by-products. For the purpose of showing, at a glance, the relation between milk prices, and the farm operating costs, Table XVI has been constructed. All the operating costs have been expressed in terms of the total quantity of milk produced, excluding milk fed to calves, and the income from by-products, similarly expressed, has been deducted therefrom. The balance, which, for short, has been termed "nett cost," represents the price per gallon which, at the level of output, costs, and prices for products other than milk, prevailing during the period, was necessary to enable all operating costs to be covered, to give to the family workers the *same* rate of wages as that received by the hired workers, and to allow a payment of 4 per cent. interest on capital. Subject to the qualifications so obviously implicit in the method of calculation, this figure of "nett cost" does represent roughly the cost per gallon from the view-point of the farmer, and has the additional value of being a figure to which the price received per gallon for milk may be related.

TABLE XVI—OPERATING COSTS, VALUE OF BY-PRODUCTS, AND "NETT COST" EXPRESSED IN PENCE PER GALLON.

Items of Expenditure	All Farms	Farms under 20 acres	Farms 20-39.9 acres	Farms 40-59.9 acres	Farms 60-99.9 acres	Farms 100-149.9 acres	Farms 150-acres
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
Rent and Rates	0.56	0.41	0.62	0.80	0.78	1.03	1.09
Concentrates	2.13	1.88	2.44	1.97	2.21	1.82	2.35
Hay, Roots, etc	0.12	0.88	0.30	0.17	0.09	0.06	0.02
Herd Replacement	0.52	0.21	0.50	0.46	0.48	0.60	0.62
Repairs and Deprecn	0.54	0.47	0.59	0.63	0.53	0.45	0.54
Manures	0.20	0.08	0.18	0.20	0.23	0.16	0.23
Miscellaneous	0.81	0.56	0.77	0.81	0.80	0.78	0.86
<b>TOTAL above items</b>	<b>5.18</b>	<b>4.49</b>	<b>5.40</b>	<b>5.04</b>	<b>5.12</b>	<b>4.90</b>	<b>5.71</b>
<b>Interest at 4 %.</b>	<b>1.93</b>	<b>1.11</b>	<b>1.55</b>	<b>1.78</b>	<b>1.73</b>	<b>2.13</b>	<b>2.53</b>
Hired Labour	1.84	1.21	0.73	1.27	1.83	2.38	2.62
Family Labour	3.59	5.26	5.95	4.69	3.50	2.51	2.19
<b>TOTAL LABOUR</b>	<b>5.43</b>	<b>6.47</b>	<b>6.68</b>	<b>5.96</b>	<b>5.33</b>	<b>4.89</b>	<b>4.81</b>
Total Costs	12.54	12.07	13.63	12.78	12.18	11.92	13.05
Value of By-products	6.07	5.97	6.11	5.69	5.93	6.05	6.72
Nett Cost per gallon	6.47	6.10	7.52	7.09	6.25	5.87	6.33
Price received per gallon	5.25	5.23	5.24	5.17	5.26	5.22	5.39

The variations in the price received per gallon in the different size-groups are due to (a) lack of uniformity in the butter-fat content of the milk sold, and (b) seasonal variations in production. In making the calculation, milk used in the house has been included on the basis set out in the appendix.

### 5. PHYSICAL FACTORS OF PRODUCTION.

The remuneration available for labour was determined by the two factors (a) value of output and (b) operating costs. The value of output in turn was the amalgam of the level of prices and the volume of physical production. In the following tables the more important physical factors of production are briefly outlined.

Table XVII shows how the available land was utilised :—

TABLE XVII —CROPS AND PASTURE.

Size of Farm	Grain Crops (acres)	Root and Green Crops including Vegetables (acres)	Total Tillage (acres)	Hay (acres)	Pasture (acres)	Total Hay and Pasture (acres)	Waste (acres)	Total Area (acres)
Under 20 acres	1	2	3	18	52	70	2	75
20-39·9 "	18	18	36	157	345	502	5	543
40-59·9 "	44	37	81	329	732	1,061	8	1,150
60-99·9 "	75	57	132	598	1,289	1,887	8	2,027
100-149·9 "	51	30	81	491	1,040	1,531	73	1,685
150- "	51	33	84	441	1,212	1,653	27	1,764
All Farms	240	177	417	2,034	4,670	6,704	123	7,244

Oats was the principal grain crop and was grown on all but 19 farms. It was used mainly for the maintenance of the live-stock, although in the case of 25 farms, some of the crop was sold. A small portion of the crop was crushed, but most of it was fed, whole, to horses. As the horses were used primarily in the production of home-grown foods for the cattle—chiefly for the dairy herd—it may be reasonably said that the oat-crop was used mainly, though indirectly, for the maintenance of the dairy-herd.

Wheat was produced on 46 farms—47 per cent. of the total number included in the enquiry. On two farms the crop proved a failure, on two other farms it had to be fed to live-stock, as it was unsuitable for milling; and on one farm it was used as seed for the following year's crop. On 41 farms, therefore, the crop was available for sale, and for personal consumption in the farmers' homes. It was used altogether in the home, in the case of 16 farms (39 per cent.); some was sold, and some was used in the home, in the case of six farms (15 per cent.); and the whole output was sold in the case of 19 farms (46 per cent.)

Barley was grown on only seven farms, and practically the whole output was sold.

On five farms sugar-beet was produced, the maximum area under the crop on any farm being  $3\frac{1}{2}$  acres. Although grown as a cash crop, it

was fitted in to the farm-organisation which existed prior to the establishment of the sugar-factories, and the by-products—tops and pulp—were used in feeding the dairy-herd.

Turnips and mangolds were grown on all but twenty farms, and these crops were consumed by the dairy-herd. Small quantities of carrots and parsnips were produced for personal consumption.

The potato crop was in many cases intended primarily for consumption in the home, but substantial quantities were fed to live-stock. Comparatively small quantities were sold off a small number of farms. Practically all the green crops, of which cabbage was the chief, were intended for personal consumption, only the surplus being fed to the live-stock.

Speaking generally, therefore, the tillage policy on these farms was based on the maintenance-requirements of the live-stock carried on the farms. It will be noticed that the percentage of available land devoted to tillage was much lower in the case of the farms under 20 acres, than in the case of the farms above that area. On these farms, it was the practice to use as much of the land as possible, for the production of hay and grass, and to rely on outside sources for the crops required for the live-stock.

Most of the available land on all the farms was devoted to hay and pasture, and, on the small farms, hay, and in some cases, pasture, had to be bought to supplement the home-produced stocks.

From the figures given, it is evident that the land was used primarily for the production of food for the live-stock, and that the main emphasis was on the most natural and cheapest foods, viz., hay and pasture.

Table XVIII shows the number of cattle on the farms on 1st May, 1937.

TABLE XVIII:—NUMBER OF CATTLE ON FARMS ON 1st MAY, 1937.

SIZE OF FARM	Cows (No.)	Bulls (No.)	Other Cattle		Total Cattle (No.)	Cows per 100 Acres (No.)	Other Cattle (including Bulls) per 100 Acres (No.)	Total Cattle per 100 Acres (No.)
			(No.)					
			2 Yr. Old	1 Yr. Old				
Under 20 Acres	33	—	1	2	36	44	4	48
20-39·9 Acres	185	4	1	6	196	34	2	36
40-59·9 „	327	6	10	20	363	28	3	31
60-99·9 „	532	15	13	51	611	26	4	30
100-149·9 „	366	12	24	109	511	22	9	31
150- „	305	5	39	71	420	17	7	24
ALL FARMS	1,748	42	88	259	2,137	24	5	29

During the year, 61 of the 88 two-year-old cattle, and 37 of the 259 one-year-old cattle, were transferred to the dairy-herd. Of the 259 one-year-old cattle on 1st May, 1937, 89 were on hands on 30th April, 1938, and of these, 82 were heifers, which it was intended to bring into the herd during the season 1938-39. Accordingly, the position of the dairy herd, actual and potential, on 1st May, 1937, may be indicated as follows:—

TABLE XIX —DAIRY HERD—ACTUAL AND 'POTENTIAL'—ON 1st MAY, 1937.

Size of Farm	Cows (No.)	2 year old Cattle intended for Dairy Herd (No.)	1 year old Cattle intended for Dairy Herd (No.)	Bulls (No.)	Total Dairy Herd ( ' Potential ' ) (No.)	Cattle (1 year and 2 year old) in excess of Herd -maintenance Requirements (No.)
Under 20 acres	33	1	2	—	36	—
20-39·9 "	185	1	3	4	193	3
40-59·9 "	327	10	6	6	349	14
60-99·9 "	532	7	29	15	583	28
100-149·9 "	366	17	46	12	241	70
160- "	305	25	33	5	368	52
All Farms	1,748	61	119	42	1,970	167

*Cows :*

All the cows were not fully productive during the year under review, as is shown by the following table :—

TABLE XX:—COWS NOT FULLY PRODUCTIVE DURING ACCOUNT PERIOD

Size of Farm	Cows not in Calf	Cows aborted	Dry Cows	Total Cows not fully productive	Cows not fully productive as percentage of total Cows in Herd on 1/5/'37
	(No.)	(No.)	(No.)	(No.)	%
Under 20 Acres ...	1	—	—	1	3
20-39·9 "	6	7	—	13	7
40-59·9 "	16	9	—	25	8
60-99·9 "	25	18	3	46	9
100-149·9 "	19	12	2	33	9
150 "	9	9	2	20	7
ALL FARMS ...	76	55	7	138	8

In addition, although there was no significant change in the number of cows on the farms on 1st May, 1937, as compared with the number on 30th April, 1938, substantial changes had to be made in the herds during the year. These changes are summarized in Table XXI.

TABLE XXI:—CHANGES IN DAIRY HERDS BY SIZE OF FARM.

Size of Farm	Cows Sold	Cows Died	Total Cows drafted out from Herds (No.)	Cows drafted out as percent- age of total Cows on 1/5/'37 (%)	Cows Bought	Home-bred Heifers transferred in (No.)	Total Cows drafted in (No.)	Home-bred Heifers as Percentage of Total Cows drafted in (%)
	(No.)	(No.)	(No.)	(%)	(No.)	(No.)	(No.)	(%)
Under 20 acres	2	—	2	6·1	3	3	6	50·0
20-39·9 "	12	4	16	8·7	11	3	14	21·4
40-59·9 "	22	10	32	9·8	20	16	36	44·4
60-99·9 "	54	8	62	11·7	46	21	67	31·3
100-149·9 "	52	8	60	16·4	28	30	58	51·7
160- "	41	7	48	15·7	12	25	37	67·6
All Farms	183	37	220	12·6	120	98	218	45·0



The financial effects of the changes indicated in the above table appear in Table XVI under the heading, "Herd-replacement."

The output of milk was of fundamental importance on these farms, and was influenced not merely by the size, but also by the quality of the herds as measured by the yield per cow. In Table XXII an estimate of these yield is given. Milk fed to calves is excluded, and, because of the impossibility of calculating the extent to which the yields of the cows that were not fully-productive fell short of their normal yields, and also because it rarely happens that on a dairy-farm all the cows in any year are fully productive, the number of cows on the farms on 1st May, 1937, has been used as the basis for making the estimate. The yield given in the table, therefore, is the "effective" rather than the "actual" yield per cow.

TABLE XXII —DISTRIBUTION OF AVERAGE 'EFFECTIVE' MILK-YIELDS BY SIZE OF FARM.

Effective Milk-yields (Gals )	Under 20 acres	20-39·9 acres	40-59·9 acres	60-99·9 acres	100-149·9 acres	150-	All Farms
250-300	—	—	—	—	1	—	1
300-349	—	1	2	—	1	1	5
350-399	—	5	4	4	4	2	19
400-449	1	6	9	8	3	5	32
450-499	1	3	6	9	2	—	21
500-549	1	1	2	6	2	1	13
550-599	—	2	—	1	1	1	5
600-649	2	—	—	—	—	—	2
Average 'effective' yield per cow (gals )	528	442	425	462	423	432	441
Milk-production per acre crops and pasture (gals.)	239	152	122	122	96	76	108

In a district depending primarily on milk-production for its income, the average yield appears to be too low for profitable results. On more than half the farms the "effective" yield (on which the money-income depended) was below 450 gallons per cow. Even allowing for milk fed to calves, and assuming that the cows not fully productive were excluded from the calculation, the actual yield on more than half the farms would not exceed 500 gallons per cow.

#### *Other Cattle.*

Table XIX showed that, after the essential replacements in the dairy-herd had been provided for, there still remained a surplus of 167 cattle. Table XXIII shows how these, together with a small number purchased during the year, were disposed of.

TABLE XXIII :—DISPOSAL OF CATTLE SURPLUS TO HERD-MAINTENANCE REQUIREMENTS.

Size of Farm	On Hands on 1/5/'37	Purchased during Account-period	Total Disposable	Sold	Died	On Hands on 30/4/'38
	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)
Under 20 Acres	—	—	—	—	—	—
20—39.9	3	—	3	3	—	—
40—59.9	14	—	14	14	—	—
60—99.9	28	—	28	28	—	—
100—149.9	70	1	71	67	1	3
150—	52	2	54	48	2	4
ALL FARMS ...	167	3	170	160	3	7

Speaking generally, it may be said that the production of "store" cattle was of comparatively little interest on those farms, especially on the farms under 100 acres. Most of this type of business was confined to a small number of farms over 100 acres.

#### *Calves.*

Table XXIV shows the production of calves in the year 1937-38, and the mortality-rate.

Most of the calves were born between mid-March and 1st May in the years 1937 and 1938. In order that each year's calf-production may be examined separately, and that the confusion likely to arise from the adjustments that would have to be made between each year's production may be avoided, calves born before 1st May, 1937, have been assumed to have been born on 1st May, and are accordingly included in the account for the year 1937-38. (To offset this, calves born prior to 1st May, 1938, have been assumed to have been born on 1st May, 1938, and will be included in the account for 1938-39).

TABLE XXIV :—MORTALITY IN CALVES.

Size of Farm	Calves born alive	Calves Died	Calves died as percentage of Calves born Alive
	(No.)	(No.)	%
Under 20 acres	32	7	22
20—39.9	172	57	33
40—59.9	304	94	31
60—99.9	482	146	30
100—149.9	328	100	31
150—	284	121	43
ALL FARMS ...	1,602	525	33

Discrepancies between the number of calves born alive, in the above table, and the number of fully-productive cows on 1st May, 1937, are explained by two facts (a) a number of cows had twin-calves, and (b)

calves that were dead when born, or that died very shortly after birth, are not included in the column headed—"calves born alive."

The mortality rate in calves disclosed by the above table appears to be very high. The average for all farms was 33 per cent. It is only on the farms under 20 acres, and over 150 acres, that there is any significant deviation from this average. This mortality represented a serious leakage in production, and had a corresponding adverse effect on the financial returns. Had all these calves lived, and had they been sold at the same price as the other calves, the income on all the farms would have been increased by approximately £2,731. This would have been equivalent to an increase of about 0.85 pence in the price per gallon of milk. Expressed in another way, the hidden cost arising from this rate, of calf-mortality was almost equal to the average cost per gallon of milk of the rent and rates combined, and was once and a half times as great as the cost of herd replacement, or of repairs and depreciation.

On only nine farms did all the calves live. On 22 farms the mortality-rate was less than 20 per cent. ; on fifty farms it was between 20 and 50 per cent. ; on twelve farms it was between 50 and 70 per cent. ; and on five farms it was between 70 and 100 per cent.

Preliminary figures for the year 1938 suggest that the mortality rate in calves was substantially lower than in 1937, but was still about 23%.

## 6. SUMMARY AND CONCLUSION.

The importance of the pig and poultry industries has been indicated in Table II. A discussion of these enterprises, however, is impossible within the limits of this paper. For the same reason, many other important aspects of the economic organisation of these farms must be omitted. I will, therefore, conclude with a brief summary of the financial results as revealed by the Tables already given.

The amount available per unit of labour (hired and family) varied between £56 and £92 per annum. If the value of the farm-produce used in the house were left out of account, the remuneration per unit of labour would have been between £38 and £74 per annum. The respective average figures for all the farms were £74 and £56.

The amount available for labour per farm, i.e. per unit of production, ranged from £97 to £351, after allowing for the value of the produce consumed in the house. If this were omitted from the account, the respective figures would have been £64 and £284.

Hired labour cost between £14 and £144 per farm, leaving a "family-income" per farm of between £80 and £207 per annum. The annual income per unit of family labour, ranged from £57 to £119. On the farms under 60 acres, where about four-fifths of the total labour required, was supplied by the family, the rate of wages that could have been paid to the family workers did not differ materially from that paid to the hired workers. On the farms between 60 and 100 acres the remuneration of the family workers was slightly better, and on the farms over 100 acres, substantially better, than that of the hired workers.

Charging family labour at the same rate as equivalent hired labour, but making no allowance for interest on capital, and the managerial and risk-taking functions of the former, the average "surplus" per farm was £23. On thirty-seven farms (38 per cent. of the total number included) there was a deficit ; on 43 farms (44 per cent.) there was a "surplus" of

less than £80 ; and on the other 18 farms (18 per cent.), the surplus varied between £80 and £200. Within each size-group, there were substantial differences between the results achieved on the individual farms.

As a final word, I should like to avail of this opportunity to express my thanks to those farmers who so generously provided the necessary data, and to the management and staff of the Creamery, whose advice and assistance were so freely given during the whole period of the survey.

## APPENDIX.

### BASIS OF VALUATION OF PRINCIPAL ITEMS WHOSE VALUE HAD TO BE ESTIMATED.

#### Products Consumed in House.

Milk has been valued at Creamery prices plus 0·8 of a penny per gallon to cover the value of the estimated skim-milk content (80%). Skim-milk used in the house has been valued at 1d. per gallon ; potatoes at 6d. per stone for the quantities actually boiled—which quantities are normally in excess of the actual requirements of the household, at least during the period of flush-production ; cabbage at 1d. per head ; parsnips and carrots at 10d. per stone ; turnips at  $\frac{1}{2}$ d. each ; pigs at their estimated sale-value when killed ; poultry and eggs at the average prices published by the Statistics Branch for 1937 ; wheat at the cost of an equivalent quantity of flour.

#### Labour.

##### *Hired Male.*

A statutory minimum wage of 24/- per week, with specified abatements for board, etc., was fixed in August, 1937. This level was maintained until May, 1938. Prior to August, 1937, the wage-rate was fixed by free contract between farmer and worker. From August, 1937, to May, 1938, overtime was payable for Sunday-work. For workers, living in, the cost of board and lodging for Sunday has been assumed to offset the amount of cash wages payable for wage-overtime on Sunday. Accordingly, the weekly rate, between August, 1937, and May, 1938, was 26/- inclusive.

##### *Hired Female.*

The cost of female labour has been calculated as follows :—

An estimate of the average number of hours devoted by each female hired-worker to farm-work as against household work, was obtained, and the percentage of the total wages to be charged against the farm was thereby calculated. The average number of hours worked per day (farm and household) was taken to be twelve. Female casual labour—employed mainly for milking cows—was

charged at the cash rate paid, plus an allowance, at the statutory rates, for such perquisites as were given.

The proportion of National Health Insurance payable by the farmer in the case of all the hired workers is included in the cost of labour. W.C.A. Insurance has been included under the general heading Insurances.

#### *Family Labour.*

The quantity of female family labour has been calculated on the same basis as female hired labour, and the value has been based on the average cost of the equivalent hired labour. Family male labour has been equated, where necessary, to units, on the basis of the farmers' estimates, and the value calculated in accordance with the Wages Act.

#### **Depreciation.**

The rates of depreciation charged were as follows :—

	£	s.	d.
Horse .. .. .	1	13	0
Pony or Mule .. .. .	0	17	0
Plough .. .. .	0	7	0
Harrow .. .. .	0	5	0
Mower .. .. .	1	0	0
Wheel-rake .. .. .	0	15	0
Hay-cart .. .. .	2	0	0
Swath Turner .. .. .	1	0	0
Pulper .. .. .	0	7	0
Creamery Can .. .. .	0	5	0
Horse-cart .. .. .	1	0	0
Pony-cart } .. .. .	0	15	0
Donkey-cart }			
Harness { Horse .. .. .	0	7	0
{ Pony .. .. .	0	6	0
{ Donkey .. .. .	0	4	0

Other less important items of machinery and equipment were depreciated on a similar scale. It was found impossible to arrive at a reliable estimate for depreciation on buildings, and, consequently, nothing has been written off buildings for the purpose of this paper. The depreciation written off carts and hay-carts has been assumed to be sufficient to provide for the renewal of wheels.

#### **Cows.**

Cows, on 1st May, 1937, have been valued on a standard basis at £12 per head. (Average of farmers' valuations, £11 10s.) Cows bought and sold have been included at actual prices. When valuing the herd as on 30/4/'38, purchased cows have been included at their actual cost price.

The cost of herd replacement has been calculated thus :—

Value of cows at start + value of cows bought and heifers transferred into the herd.

Value of cows sold + receipts, if any, from cows that died + value of cows on hands at end of account-period.

**Calves.**

In the table showing the value of live and dead-stock as on 1/5/1937, calves have been valued at £2 per head.

**Heifers and Other Cattle.**

Heifers transferred into the herd have been valued at £12 (2 year old) and £16 (3 year old). "Other cattle" have been valued in accordance with the prices published by the Statistics Branch.

**Sows and Pigs.**

For the opening and closing inventories, sows have been valued at £5 per head, and pigs in accordance with the farmers' estimates.

**Poultry.**

Stock birds have been valued as follows:—Hens, 2/-; ducks, 2/-; geese, 5/-; turkeys, 10/-.

**Draught Animals.**

Horses, ponies, and mules have been included at the farmers' valuations. Asses have been taken at a standard value of £1 each.

**DISCUSSION ON MR. MURPHY'S PAPER.**

DR. HENRY KENNEDY said that it is with very sincere pleasure that he proposed this vote of thanks to Mr. Murphy for his very admirable paper which serves the dual purpose of statistics and social enquiry to which this Society has devoted itself. The paper itself is a real tribute to the personality and industry of Mr. Murphy. Dr. Kennedy knew something about the district in which Mr. Murphy's investigations have been carried out and it is a district which, compares more than favourably with the average in the country. It is a district where the land is good, where farming is on a relatively high level and where the community are co-operatively organised with one of the best co-operative societies in the country serving them.

What is the moral of these investigations for the general public and particularly for that portion of the public engaged in industrial and commercial pursuits? The fact is exposed that in that district in that year in none of the farming groups did the unit of non-hired labour get the statutory wages of a farm labourer if you allow a modest 4 per cent. on the capital value of his property. These facts show that the farming community at present constitute a very poor market, by reason of low purchasing power, for industrial products, and make clear the urgency of improvement in the interests alike of town and country.

Assistance can and he hoped will be given in greater measure by the Government, but when the Government will have done all that is possible and practicable there still lies an enormous gap between that and what is desirable. That gap can only be filled by a new technique of agriculture, departing from tradition, by which costs can be lowered and production increased. That technique is known. It only remains to demonstrate it with vigour and, above all, with conviction.

In two sentences Mr. Murphy has put his finger on the key problem of the betterment of the farmer's income. On page 12 he says, referring to costs of production: "Except in the case of concentrates and

manures, the costs were essentially of an over-head nature. Their effects, therefore, on the labour income could be reduced mainly by increasing the turn-over"; and on page 13: "As family labour, especially on the farms under 60 acres, constituted the greater portion of the labour force, and as the quantity of family labour cannot be easily and quickly adjusted to economic conditions, the element of rigidity is very great." How is increased turnover, without seriously increased cost, to be effected?

He drew their attention to three fundamental points in Mr. Murphy's paper—the low output of milk per cow and per acre, the mortality in calves, the mortality in cattle.

All these relate to the fundamental problem of Irish agriculture. The problem is how to enable the farmer to produce on his own farm at the minimum cost winter fodder for his cattle in adequate quantities and of such high nutritional value as to ensure that his young store cattle will grow and increase in weight during the winter; that his cows will milk for some months longer into the winter; that when in the spring they calve they will be in such good condition as to produce healthy calves and that, after calving, they will be in such condition and have such adequate food supplies available as to enable them to give milk to their full capacity, instead of, as at present, having to repair in their own bodies the wastage of the winter, and to put on their backs the fat that should go into the milk pail. Mainly as a result of bad winter feed, the yield of milk per cow averages 380 gallons as against 700-750 gallons in Holland, Denmark and New Zealand.

With reference to the question of production per acre, the carrying capacity in Mr. Murphy's studies was 24 low yielding cows per 100 acres against over 46 high yielding cows per 100 acres on 550 typical dairy farms costed by the New Zealand Department of Agriculture. The production was about 40 lbs. of butter-fat per acre in Mr. Murphy's figures as against 117 lbs. on the New Zealand farms. Grass is the product of rain and fertility. The rain we have always with us, the fertility can be provided at a reasonable cost. If there is to be hope of a reasonable return, production must be doubled.

Turning to some of the by-products of winter malnutrition, the calf losses in the spring of 1937 were 33 per cent., after a wet summer with bad hay, they dropped to 23 per cent. in 1938 after a reasonably fine summer with better hay. This calf mortality, in view of the importance of the cattle trade, represents an appalling loss. The scientists working in the U.S.A. Bureau of Dairy Industry have shown clearly that it is due mainly to the pre-natal malnutrition of the cows, and that it is associated with other evils such as difficulty and, in many cases, failure to produce pregnancy in the cows, and deterioration in health and staying power of the cows. Mark the high percentage of total costs represented by herd depreciation.

Mr. Murphy's paper shows clearly on the basis of cold facts and figures the serious condition of our agriculture.

SENATOR SIR JOHN KEANE, seconding the vote of thanks, said he had always been interested in this subject of farming costs. It was essential to any policy of farming. The paper was almost a pioneer document, showing how backward they were. It was a terrible indictment of the technical advisers to the Government and of the Government itself, because they had been spending half a million pounds through the Department of Agriculture without ever getting at the

basic facts of agricultural economy. A large amount of money voted to the Department should be devoted to work of the kind done by Mr. Murphy. This experiment in a limited area showed they could get more output on the smaller farms, but only at the cost of a lower standard of living. All that should have been known long before this policy had been embarked upon. It was sad to think that Mr. Murphy had to do all this work without proper assistance. The Department of Agriculture were fixing the price of beet and other things without any knowledge of what they cost to produce. This was why he considered the paper so valuable, so that they would know the problem they had to tackle. There were very wide differences in individual farms. There was a deplorable tendency of trying to increase prices by subsidies. The only thing to do was to improve the technique of production, and, as Mr. Murphy and Dr. Kennedy had said, the scope for that was enormous. It came as a surprise to him that the mortality of calves was so high, and it should have been known over the whole country years ago. He hoped something would be done at last. All the facts were contained in the paper they had heard read, and he hoped the research would be continued. Mr. Murphy deserved the thanks of the whole community for having drawn attention to this vital problem.

SENATOR JOSEPH JOHNSTON said he was unable to give this paper the amount of preliminary study that was desirable. The subject was a very difficult one, and the matters dealt with so important that if one had time to think them all out, each point would take a speech lasting half an hour. The total output per acre was deplorably low, and the main national effort must be to raise that total output by every means that would tend to raise it. They know that output per acre was higher on small farms than on large ones, and every effort should be made to increase the output on the large farms. The paper also emphasised the fact that the output per person occupied was very much higher on the larger farms than on the smaller ones. As things were at present it was economically impossible for farm labourers employed on farms of 60 acres and over to obtain more wages than they were getting; and the only farm that could hold out hope of paying a higher wage to the labourer and offer some profit to the family and manager was the very large and well-equipped farm. He had studied, over the last 10 or 12 years, the list of agricultural implements and machinery imported to this country and those made at home. During that period the imports of machinery rose to about £300,000 annually, and the value of machinery manufactured at home was about £107,000. That was £400,000 worth altogether, and the cost would be only about £1 per farmer, and that was not a great deal. They should improve their technique in every way, as suggested by Mr. Murphy and Sir John Keane. The great difficulty of farmers at present was how to get capital, and as things were now no farmer could give security to a bank for a loan. He was told lately of a man who sold a farm for £4,500, and no sooner was it sold than the Land Commission stepped in and acquired the farm and paid the new owner £3,000 for it although he had never used it. That kind of thing was destructive of confidence and credit, and it applied to small farms as well as large. Under the present conditions such farms could not be accepted as security for loans, and that was a matter that should be looked into.

MR. F. HUSSEY, in expressing appreciation of the paper read, con-



gratulated Mr. Murphy, particularly for his use of the survey method of accountancy. It was difficult to understand how the method had not been employed more often here, particularly as the type of agriculture carried out in Ireland was nearly the same in all areas. The soils were generally similar and the climate had not room to vary. He would like to ask Mr. Murphy in a genuine spirit of enquiry if he thought that a similar method might be feasible in other districts where dairying was not a predominant feature. He would also like more information regarding the cost of herd replacement.

PROFESSOR GEORGE O'BRIEN said Mr. Murphy's paper would probably be the most valuable single document before the Agricultural Commission. Nobody could exaggerate its importance. The paper contained essential data for Irish agricultural problems. He thought the whole discussion had been unduly pessimistic. The Banking Commission had come to the conclusion that the prospects for the future were favourable to agricultural property. From 1850 right up to the war the terms of exchange tended to move in favour of agricultural producers. They had got to exploit the conditions in their favour for all they were worth, but they must not do anything to increase the cost of living or increase the cost of production to the farmers. For the last 15 years the secondary industries had been supported by agriculture, but no country could go on where industries had to be supported by one another. They had arrived at the stage where industry had to be bolstered up artificially, and it was now suggested that agriculture should be bolstered up artificially also. It could not be done without serious repercussions on the standard of living of all classes.

MR. D. J. MADDOCK said he would like to express his gratitude to Mr. Murphy from the point of view of statistics. Great credit was due to the Statistics Office, who pioneered with estimates of agricultural output for the whole country for 1926-27, and only people directly concerned with this work or farm costings like Mr. Murphy's could appreciate its difficulty. One very interesting matter that had emerged was the high proportion of poultry that was consumed on the farms. It was much higher than most of them would have thought. Regarding the mortality of calves, he did not think the figures for the whole country were as bad as for the particular area in Mr. Murphy's survey.

REV. FATHER COYNE, S.J., said what struck him most during the discussion was the vast amount of knowledge contained in the audience—and none of them had a share in controlling the agricultural policy of the country. As Dr. Kennedy suggested in the beginning, their agriculture was in a primitive state, and as Senator Sir John Keane had said, their Agricultural Department was also in a primitive way. If they could bring these two things to a proper level, agriculture would be all right. Could they not have provincial Chambers of Agriculture the same as they had in France? Could they not have an Agricultural Chamber in Munster with Doctor Kennedy in charge of it? What was hindering all progress in this country was the fact that Ministers in Parliament were afraid of being asked questions and afraid of something that would be politically injurious to them. He had the greatest respect for the Department of Agriculture, but that Department was working in an impossible situation and evidently they did not know what was contained in Mr. Murphy's paper.

THE PRESIDENT said that Mr. Murphy should be very satisfied with having provoked this valuable discussion covering a vital aspect of

the Country's Agricultural Industry. They had all enjoyed listening to the reading of the paper and following the illustrations presented on the lantern screen, and he hoped Mr. Murphy would continue to make these investigations and thus stimulate general interest in them. It is always recognised that statistics have a much greater value when comparisons can be made as between different years. Here was a first attempt and it is hoped that figures for another year or years will at some later date be made available. The President said that he had recently seen in the *London Times* the results of a survey of some 200 farms in the Eastern Counties of England and the "Farm Income" figures, or financial results, bore a strong resemblance to Mr. Murphy's figures as to how the farmers fared. They were:—

Percentage of Farms showing a	Eastern Counties	
	Cork-Limerick	of England.
deficit	38	33
surplus	44	48
fair surplus	18	19
	<hr/>	<hr/>
	100	100

Mr. Murphy should accordingly, be quite satisfied with his investigations.

The President had much pleasure in conveying to Mr. Murphy the best thanks of the Society for his paper.

MR. MURPHY, replying to the vote of thanks, said that his paper consisted mostly of tables, but in that way every person could examine it for himself. He only proposed to reply to a few of the points raised, but he would like to emphasise that instead of being pessimistic he was very optimistic because there was great room for improvement. There was no reason why the output in the particular district in his survey should not be increased very much. He agreed with Sir John Keane that there would have to be credit available to the farmers. The co-operative creameries represented the only organisation the farmers had. A very simple credit scheme could be made available to the farmers through the creameries and they should not have to give security on their lands. The whole problem was one of physically increasing production. There was no hope of reducing costs when 50 per cent. of the cost was labour, and in those farms 80 per cent. of the labour was family labour. In regard to Mr. Hussey's question about the applicability of the survey method, he believed it could be applied more readily in this country in tillage than to the dairying districts. Dealing with herd replacement, Mr. Murphy said that actually the figures he took were £12 for heifers down to three year olds and £16 for the others. The farmers considered their own heifers well worth £18 and, therefore, the cost of replacement was, if anything, too low. The farmer did not look upon the produce used in his house as a very essential part of his income. He could not educate his son by eating his cabbage. On the question of cattle and calves, his specification was simply including all cattle of a certain heading. The figure of 33 per cent. mortality only applied to that particular district for that particular year—1937. The district had one of the best creameries in the country. He would like to issue a warning against any distinction that might be drawn between this district and any other district. Conditions that obtained in one place might not obtain in another. The mortality of calves varies each year. Last year it was 26 per cent. in County Limerick. This year it would probably be up to 33 per cent., as it was a few years ago.