University of Cambridge
Department of Agriculture

Farm Economics Branch

Report No. 19

(Issued July, 1932)

An Economic Survey of Agriculture in the Eastern Counties of England

1931

W. HEFFER & SONS Ltd., CAMBRIDGE
1932

PRICE TWO SHILLINGS AND SIXPENCE NET, POSTAGE 3d.

University of Cambridge
Department of Agriculture

Farm Economics Branch

Report No. 19

(Issued July, 1932)

An Economic Survey of Agriculture in the Eastern Counties of England

1931

W. HEFFER & SONS, LTD., CAMBRIDGE

1932

CONTENTS

Contents—*continued.*

PREFACE

THIS is essentially an *interim* Report. It surveys the economic position of agriculture in the eastern counties of England during 1931, and is largely descriptive in character. It formulates no agricultural policy. It is mainly concerned in determining the nature and extent of the agricultural problem, and in providing the background of detail essential to constructive action.

The results of this investigation illustrate that agriculture, even in the eastern counties of England, assumes many forms, some with conflicting interests, and each variously affected by changes in price and cost levels. All farmers have experienced a narrowing of the margin between cost and income, although in certain districts and with certain types of farming the depression has been much more acute than in others. The data herein presented provide a basis for assessing the relative claims of the various sections of producers.

During the past six months conditions have altered considerably, and, on the whole, for the worse. Comparing the months January to June, 1932, with the same period in 1931, an increase of 18 per cent. in the cost of feeding stuffs and a decrease of 13 per cent. in the price of livestock and livestock products, has occurred. It is true that cereal prices have risen slightly (about 6 per cent.), and that, as a result of the *Wheat Act*, 1932, the current year's crop will realise a considerably higher figure than that of 1931. But it is probable that, on balance, the income of the majority of producers will be even less than last year. It is therefore important that developments should be carefully watched.

This investigation has a further object. In future business methods must enter more largely into the farmer's daily duties. The need for the elimination of waste, whether of labour, capital, or materials, entails the recording of transactions, and the preparation and intelligent interpretation of financial statements. Interpretation by the individual farmer of such statements will be facilitated by a knowledge of the most important business factors influencing profits, and of standards of measurement for these factors. At the present time the development of a technique of this nature is particularly urgent.

It remains only to give grateful acknowledgement first to those farmers (more than 1,000 in all) who so willingly and courteously contributed the information on which this study is based, and secondly to the recorders whose arduous duty it was to collect the data. In this connection the co-operation of the Agricultural Organisers of the various counties must be specially mentioned, particularly that of Mr. J. Hunter-Smith (Hertfordshire), Mr. J. C. Leslie (Essex), and Mr. J. A. McMillan (Cambridgeshire), who, with their staffs, collected no less than one-quarter of the total farm records secured. But for this material assistance the study would have been much less comprehensive.

The following gentlemen assisted in the recording:—R. McG. Carslaw, C. A. B. Caukwell, G. W. Channon, R. F. Edwards, D. J. Ewing, H. W. Gardner, T. A. Guest, R. P. Hawkins, J. Hunter-Smith, W. H. Kirkpatrick, A. W. Menzies-Kitchin, J. W. Reid, G. Ll. Rogers, R. N. Sadler, R. J. Scott, and S. F. Simmons.

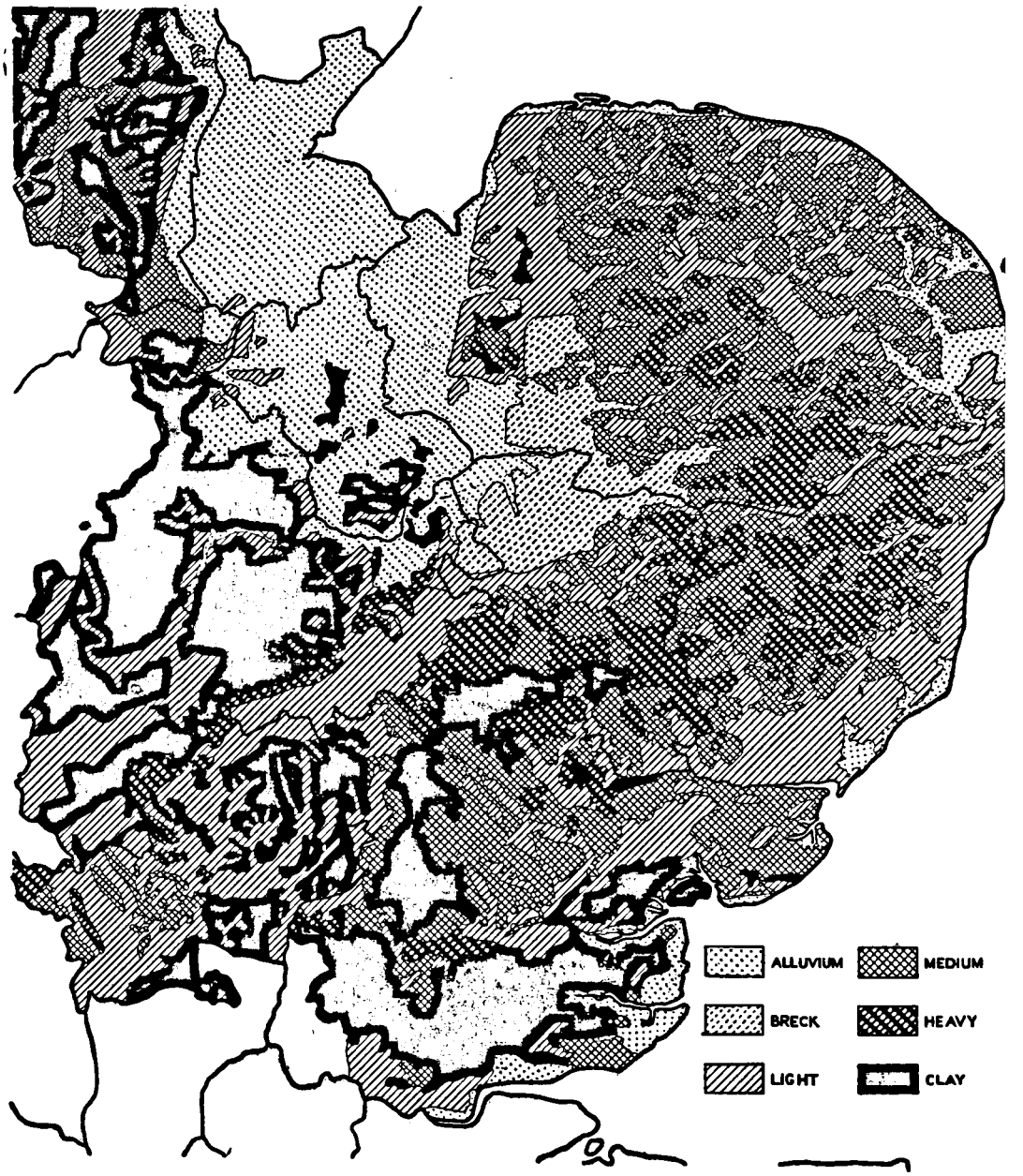
Mr. T. J. Hunt has been responsible for much of the statistical analysis.

R. McG. CARSLAW,
A. W. MENZIES-KITCHIN,
P. E. GRAVES.

DEPARTMENT OF AGRICULTURE,
CAMBRIDGE UNIVERSITY.
July, 1932.

"The purposes of scientific investigation in social science is the production of data which logical reasoning can apply to, and use in, the conduct of human affairs."

J. C. COBB.



DISTRIBUTION OF SOIL TYPES

(Scale approximately 17 miles to the inch)

CHAPTER I.

1. PHYSICAL CHARACTERISTICS OF THE DISTRICT

THE six counties of Norfolk, Suffolk, Essex, Hertford, Cambridge (ex. Isle of Ely) and Huntingdon, which furnish the field of the present survey, form the principal corn growing district of Britain. Together they contain an area of approximately 4,200,000 acres, of which 3,200,000 acres are under crops and grass, and 170,000 acres are described as rough grazings. Stretching southwards from the Wash to the Thames Valley, bounded on the east by the North Sea, and on the west by the Isle of Ely and the counties of Lincoln, Bedford, Northampton, Buckingham and Middlesex, they form an undulating plain, never rising more than 500 feet above sea-level, in which such formations as the london and boulder clays, and the later glacial deposits, over-lie the solid chalk.

Norfolk, the largest and most northern member of the six counties, covers approximately 1,300,000 acres and is characterised by light easily worked soils. On the west of the county lies the "fenland," a fertile tract of peat and silt deposits. These alluviums are succeeded by roughly 400 square miles of infertile sand giving rise to the barren "breckland" area around Thetford and Methwold. In the north-east a calcareous loam predominates, containing some of the best barley land in England. In the south-east, boulder clay, frequently of a very heavy nature occurs, and, on the east coast, many of the river estuaries form large tracts of marshland.

Suffolk adjoins Norfolk on the south, and is approximately 944,000 acres in extent. Boulder clay occupies the greater part of the centre and west of the county, while light sands and gravels characterise the east coast and the north-western corner around Mildenhall and Brandon. Much of the boulder clay is of a cold stubborn nature, some of the heaviest and most intractable soils being found in the neighbourhood of Haverhill. In comparison, the boulder clay of central Suffolk is lighter, richer, and more fertile.

Essex is bounded on the north by Suffolk, on the south by the river Thames, and on the west by Hertfordshire and Middlesex. It covers an

area of roughly 973,000 acres and is essentially a county of heavy soils. The principal features of the county are large tracts of boulder clay in the north and of london clay in the south, the former being under the plough, the latter mainly devoted to grass dairying. Glacial gravels occur to the north-east around Colchester, while tracts of marsh grazing lie on the south-eastern coast line, along the estuaries of the Crouch, the Blackwater and the Thames. A small area of brick earth near Southend forms what is probably the most fertile district in the county.

4. Hertfordshire lies to the west of Essex, and is bounded on the north by Bedfordshire and Cambridgeshire, on the west by Buckinghamshire and on the south by Middlesex. It extends to 403,000 acres and contains a variety of soils. A narrow outcrop of chalk runs south-west from Royston to Tring; to the west and north-west are tracts of chalk marl; in the south, around Elstree and Hatfield, london clay appears at the surface; over the rest of the county boulder clays, glacial loams, and gravels predominate.

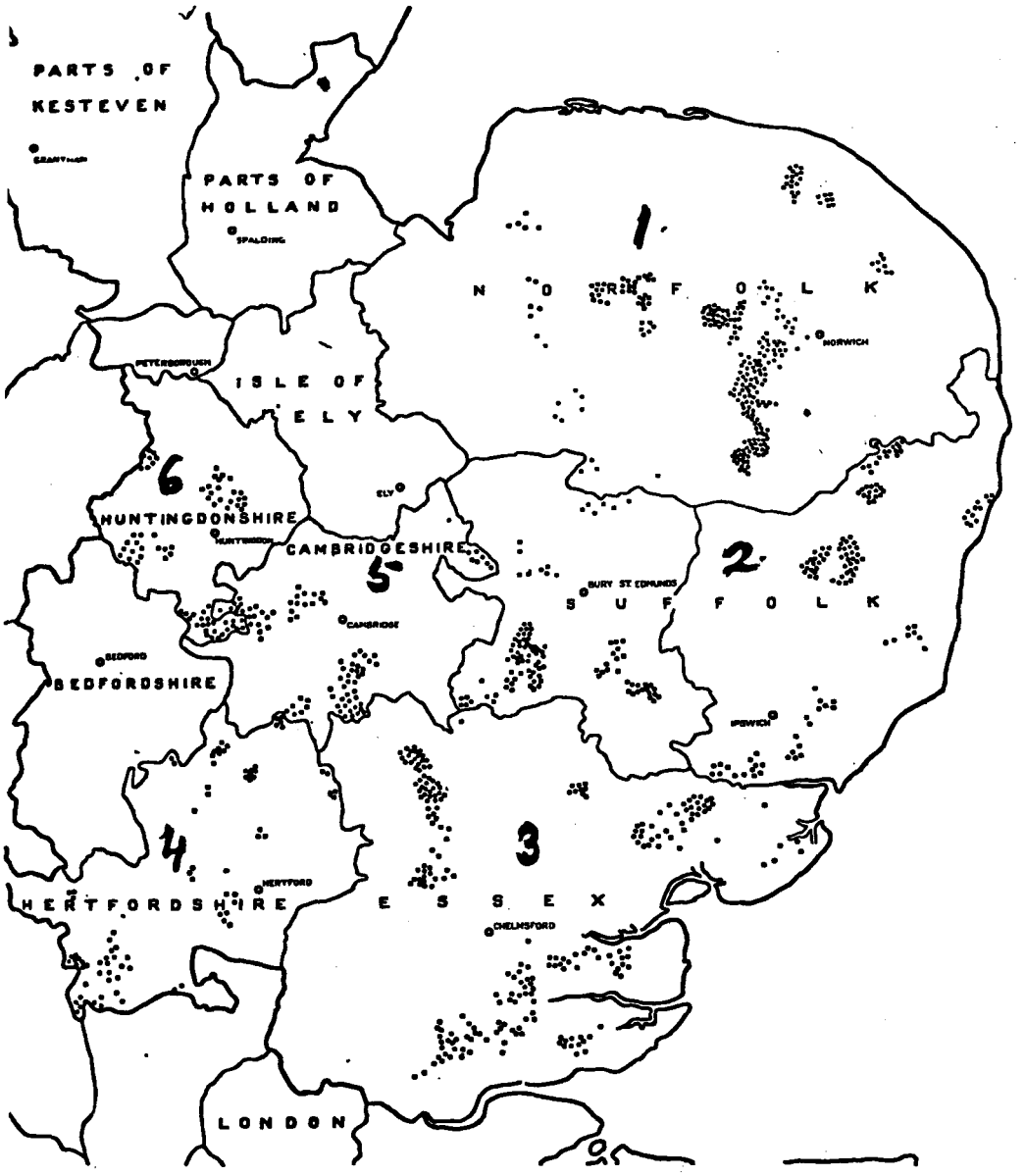
5 Cambridgeshire (ex. Isle of Ely) is bounded on the north by the fens and on the west by the shires of Huntingdon and Bedford. It comprises 314,000 acres, and its soil characteristics, unlike those of Hertfordshire, are clearly defined. The western portion of the county is occupied by heavy boulder clay. Towards the south and south-east the soil is a light chalk with occasional patches of gravel. From Burwell in the east a strip of chalk marl runs across the county to the south-west. The north is occupied by typical fen soil.

6. Huntingdon, which lies to the west of Cambridge, covers an area of 233,000 acres, and is the smallest of the six counties. The soil is mainly a heavy boulder clay, with outcroppings of oxford clay in central Huntingdon. A narrow strip of marshland, flanked by a belt of valley gravel, extends along the Ouse valley from St. Neots to St. Ives. The north-eastern corner of the county is occupied by fenland.

Statistics of crop acreage, number of holdings, livestock, and workers, are given in Table I in the Appendix. These figures illustrate certain important trends in the agricultural organisation of the Province since the year 1885.

2. THE SAMPLE

The area from which the sample is drawn comprises the six counties of Norfolk, Suffolk, Essex, Hertfordshire, Cambridgeshire (excluding Isle of Ely) and Huntingdonshire. A general description of the locality has been given in the previous section, but, at the risk of repetition, it may here be stated



DISTRIBUTION OF RECORDED FARMS

(Scale approximately 17 miles to the inch)

that these counties total some 3,200,000 acres of crops and grass, of which almost exactly two-thirds is returned as arable land. A wide variety of soil types is found in the area, ranging from the light blowing sand of the Norfolk "breck," to heavy london clay in the south of Essex and Hertfordshire. Of the total acreage involved approximately 50 per cent. is loam of one sort or another, 25 per cent. is chalk, sand, or gravel, 20 per cent. is clay, while 5 per cent. is peat or silt. There are, in round numbers, 39,000 holdings over 1 acre in size, of which only 21,000 are over 20 acres.

In selecting the "sample" for investigation, attention has been confined to the three principal soil types of the district, viz: (1) loams, (2) clays, and (3) chalks, sands and gravels. Further, only holdings of 20 acres or more have been taken into consideration, while fruit, market garden, hobby farms and other specialist types of undertaking have been excluded from the scope of the study. Except for these qualifications every endeavour has been made to ensure that the sample selected should be a random one, representative of conditions in the "universe." With this in view *all* the occupiers of 20 acres and upwards in certain typical parishes distributed throughout the six counties were visited. All together, 213 parishes were thus investigated, and the 1,935 occupiers of 20 acres and upwards in these parishes were found to be comprised as follows:—

	Per cent.
Occupiers of mixed farms	85·1
" " specialised farms	4·2
" " accommodation grass (dealers, butchers, etc.)	2·5
" " "Home" or hobby farms ..	2·1
" " private gardens and parks ..	1·8
" " derelict holdings	1·6
" " land held for building	1·1
" " recreation grounds	0·3
" " gravel and clay pits, etc. ..	0·2
Occupiers not traced	1·1
Total occupiers	100·0

Records were obtained from 1028 occupiers (53 per cent. of the total) in these 213 parishes. Of the records obtained 45 were not used for purposes of analysis owing to their being incomplete, or for some other reason. Thus the data presented in the following pages refers to 983 farms. The distribution

of these farms between the various size and soil groups, and the total acreage represented, is shown in the following table:

Size group (acres).		Number of farms and total acreage covered by records. Clays.	Loams.	Gravel, chalk and sand.	All soils.
20–50	Farms ..	45	98	46	189
	Acres	1626½	3539	1622	6787½
50–100	Farms ..	57	147	58	262
	Acres ..	4174½	10786	4434½	19395
100–150	Farms ..	50	70	37	157
	Acres ..	6260½	8842	4645½	19748
150–300	Farms ..	91	71	67	229
	Acres ..	20186	15490	14151½	49827½
300–500	Farms ..	47	28	34	109
	Acres ..	18295½	10592	13806	42693½
Over 500	Farms ..	16	5	16	37
	Acres ..	11881	3190	13141	28212
All sizes	Farms ..	306	419	258	983
	Acres ..	62424	52439	51800½	166663½

It will be observed that the area covered by the sample represents no less than 166,663 acres, or just over 5 per cent. of the total area (including holdings below 20 acres) of crops and grass in the six counties, while the number of recorded farms, at 983, represents a little less than 5 per cent. of the total number of holdings of 20 acres and upwards. Each of the six counties contributes its quota to the total number of records secured, and each of the principal agricultural areas in the district is represented.

3. RELIABILITY OF DATA

In a study such as the present, the reliability of the observed data must be considered from two angles, viz:—(1) the accuracy of the individual observations, and (2) the representativeness of the sample. Where an attempt is made, as in the present instance, to depict average, or "normal" conditions, precision in measuring the individual observations does not in itself ensure the reliability of the results, and, indeed, is of less importance than representativeness of sample. For example, if it were desired to obtain a figure representing the average milk yield per cow in any district, the result would be more accurate if founded on estimates to the nearest 100 gallons for a large number of farms chosen indiscriminately throughout the district, than if based on actual yields from recorded herds, or, still worse, on the most accurate possible

measurement of the yield of a single cow. This is not to say, of course, that the accuracy of the individual measurements is of no importance—the reverse is the case—but only that it is necessary to view this aspect of reliability in a proper perspective. From the description given in the previous section of this chapter it will be evident that every precaution has been taken to avoid "bias" in selecting the sample, and it therefore only remains to consider the accuracy of the individual observations.

The data for this investigation were collected by visiting and interrogating each farmer personally. Where accounts or other records were kept these were referred to when possible, but most of the information could be obtained only by relying on the farmer's personal knowledge of his business organisation. In view of this, the information collected dealt only with the ordinary transactions and general organisation of each farm, i.e. with matters of which the majority of farmers have personal knowledge. Further, the questionnaire used was designed in such a way that much of the data could be cross-checked by the recorder at the time of his visit. For example, every farmer knows the area of his farm within a reasonable degree of accuracy, and from this base the acreage under the various crops can be checked, and errors of estimation minimised. Similarly with livestock, the numbers in hand at the beginning of the year plus purchases and births can be checked against numbers in hand at the end of the year, plus sales and deaths. Purchases of fertilisers and seed were obtained by considering each crop individually. Yields were obtained with such precision as the skill and experience of the farmer permitted; in many cases threshing yields were available as a check. Prices presented no great difficulty. Expenditure on foodstuffs was ascertained by the consideration of each individual type of foodstuff purchased. The labour bill was calculated by aggregating the wages and perquisites of each of the regular employees, and adding the estimated amount of expenditure on casual labour. Miscellaneous expenses and receipts were obtained by enumerating a long list (over 50) of possible headings under which these transactions might have occurred. Thus petrol, paraffin, oil, coal, vet., blacksmith, etc., etc., were each considered individually, and with many of these items approximate cross-checking was possible (e.g. coal with number of days threshing, steam cultivation, and household consumption; petrol, oil, and paraffin with number of days tractor work, fixed engines, and motor car mileage; shoeing bills with number of horses, etc., etc.).

Undoubtedly in the case of individual records inaccuracies occur in many of the items, but experience with this technique suggests that significant discrepancies are exceptional in details of major importance. In this connection it must be borne in mind that the financial results of each farm have

been computed from the farmer's answers to something like 300 separate questions, and that an over-estimate in one item is likely to be cancelled by an under-estimate in another. Further, as all the figures given in this *Report* are arrived at by averaging the recorded observations on a large number of farms, such errors of measurement as may occur in individual cases are almost certain to be of a compensating nature. As yet no evidence has been secured to suggest that "bias" occurs in the information supplied by farmers in a well designed survey investigation.

4. WEATHER CONDITIONS

The eastern counties form the driest district in England, having a rainfall 25 per cent. below that of the country as a whole. Below are given the average monthly rainfalls, recorded at 22 stations in the Province, for (*a*) the decade 1920–30, (*b*) the exceptionally dry year 1920–21, and (*c*) the crop year covered by the present investigation. In reference to the averages for the decade 1920–30 the following quotation from *British Rainfall* (1930, p. 2) is pertinent. "Since 1921, the accumulated excess of rainfall over the British Isles as a whole has amounted to 90 per cent. of the average annual amount. In the last nine years we have received, therefore, nearly as much rain as falls on the average in 10 years. So long a run of wet years has not occurred since the nine years 1875 to 1883, when the accumulated excess was 82 per cent., or slightly less than that just recorded."

	Average rainfall in the six eastern counties.*		
Month.	Decade 1920–30.	Year 1920–21.	Year 1930–31.
October	2·38	0·80	0·98
November ..	2·41	0·78	3·70
December ..	2·35	2·63	2·09
January	2·18	1·97	1·98
February	1·65	0·35	2·42
March	1·20	1·03	0·34
April	1·90	1·45	3·31
May	1·84	1·19	3·07
June	1·58	0·40	1·51
July	2·50	0·38	3·43
August	2·12	1·36	3·67
September ..	2·33	1·55	2·25
Total ..	24·44	13·89	28·75

* Compiled from *British Rainfall*, annual publication of the Meteorological Office.

The year 1931 was abnormally wet and sunless, and the heavy rains occurring during the summer months were specially unfavourable to crop production. It will be observed from the above table that with the exception of June, which was comparatively dry, over 3 inches of rain fell in each month April to August inclusive. The wet weather before and during harvest was particularly destructive to cereal crops. Throughout the year the heavy lands of the district suffered from excessive rain, and poor cereal and root yields were obtained. On the other hand, the light lands were benefited by the plentiful supply of moisture, and on these yields were stated to be above the average. The year was excellent for the growth of grass and other green crops, but clovers and other small seeds intended for threshing were, on account of excessive rain and lack of sun, almost a complete failure.

5. PRICES

Fluctuations in price and cost levels reflect changing economic conditions, and are responsible for alterations in types and methods of production. In times of prosperity agricultural practice alters slowly, but as the margin between cost and price narrows, new methods are adopted with a view to maintaining profits. The present widespread distress arises from the fact that fluctuations in price and cost levels have been so violent during the past 17 years that it has been impossible to keep farm organisation adjusted to current economic conditions. For this reason a brief review of price and cost levels forms a necessary introduction to a study of the results of the present investigation.

Throughout the war prices rose rapidly, and in the "peak" year 1920 agricultural produce sold off English farms was making on the average nearly three times as much (192 per cent.) as it had done in the base years 1911–13. For 1921, agricultural produce prices dropped to just over double (119 per cent.), and the comparable figure in the following year was only some 70 per cent. above the pre-war level. Thereafter, apart from a few small and temporary gains, prices fell steadily, and in November, 1931, were only 12 per cent. above the pre-war level. This drop in prices has not been evenly distributed over all types of agricultural produce, for livestock, livestock products, fruit and vegetables, have suffered less severely than have cereals and other farm

crops, a fact illustrated in the following figures abstracted from *Agricultural Statistics*, 1930, Pt. II:—

Harvest year, September–August.	Percentage increase in prices of certain groups of commodities as compared with 1911–13.		
	Livestock and livestock products.	Cereals and farm crops.	Fruit and vegetables.
1919–20	181	197	202
1920–21	163	120	252
1921–22	82	64	192
1922–23	71	28	73
1923–24	62	45	114
1924–25	65	53	75
1925–26	60	31	94
1926–27	49	39	59
1927–28	49	39	73
1928–29	50	25	77
1929–30	50	11	55
1930–31	36	1	23

The cost level of farm requirements has undergone the same violent fluctuations as were evidenced in the case of prices. From 1914 to 1920 costs rose steadily, though, on the whole, more slowly than prices. In 1920 costs were approximately 2½ times higher than during the period 1911–13, but since 1920, although costs have fallen in sympathy with produce prices, they have not kept pace with the rapid price decline. Again, the fall in costs has not been evenly distributed over all farm requirements, for whereas in 1931 foodstuffs, fertilisers, seeds and rents had returned to approximately their pre-war level, the cost of machinery and implements was some 65 per cent., and labour 100 per cent. higher than in 1911–13.

The prices of the principal cash crops throughout the period August, 1931 to May, 1932 (during which time the 1931 crop sales covered by the present investigation were mainly made) are compared in the following figures with the average prices ruling in certain earlier years. Livestock and livestock product prices are also given. Prices for the period November, 1930, to October 1931 (during which time the livestock and livestock product sales covered by the present investigation were effected) are compared with earlier years. It will be noted that the prices of livestock and their products have fallen less than those of cereals.

*Crop Prices**

	Wheat per cwt.	Barley. per cwt.	Oats. per cwt.	Potatoes. per ton.	Sugar beet per ton.	Clover hay per ton.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
1911–13	7 7	7 11	7 1	78 10	21 6	89 0
1927	11 6	11 9	9 1	137 6	55 5	99 6
1928	10 0	11 0	10 5	135 0	52 0	101 6
1929	9 10	9 11	8 10	92 6	52 11	113 6
1930	8 0	7 11	6 2	76 0	49 10	106 6
1931	5 9	7 11	6 3	148 6	42 0†	77 6
August 1931 ..	6 4	7 7	6 5	117 0	—	77 0
September " ..	4 9	9 10	5 7	137 0	—	76 0
October " ..	5 8	9 2	6 2	151 0	—	75 0
November " ..	6 9	9 0	6 10	164 0	—	71 6
December " ..	6 4	8 5	6 11	185 0	—	70 0
January 1932 ..	5 10	8 3	7 0	231 6	—	70 0
February " ..	5 8	8 2	7 3	211 6	—	67 6
March " ..	6 0	8 3	7 5	207 6	—	64 6
April " ..	6 0	7 9	7 5	217 6	—	63 6
May " ..	6 1	7 2	7 11	219 0	—	63 6

Livestock and Livestock Product Prices

	Fat cattle 2nd quality Shorthorn per cwt. l.w.	Fat sheep 2nd quality Longwool per lb. d.w.	Fat pigs, 2nd quality bacon per sc. d.w.	Milk. per gall.	Eggs 2nd quality per 120.
	s. d.	*d.*	*s. d.*	*d.*	*s. d.*
1911–13	34 10	7¼	10 0	8¾	11 6
1927	43 8	10¾	14 5	14	16 8
1928	47 9	12	13 5	14¼	16 10
1929	45 10	11¼	15 11	14¾	18 4
1930	45 6	11½	15 4	14½	15 7
1931	42 3	9¾	10 8	12⅞	13 4
November 1930	42 3	10¾	12 11	15¾	23 6
December "	42 7	10¾	12 7	16¼	19 2
January 1931	43 1	10¾	12 9	16¼	15 10
February "	42 9	10½	12 9	16¼	13 4
March "	42 8	10½	12 5	15	10 5
April "	43 4	10½	12 4	11½	8 11
May "	43 8	10¼	12 0	11	8 9
June "	45 7	10¼	10 10	11⅛	8 11
July "	45 8	9¾	9 11	11⅜	11 8
August "	43 5	9¾	9 9	11⅜	12 11
September "	40 6	9¼	9 3	11¼	14 4
October "	39 3	9	9 0	11⅛	17 11

* The prices quoted in this and the subsequent four tables have been compiled from Ministry of Agriculture Statistics. It should be noted that they do not represent *farm* prices, and that their chief value is in affording comparison of fluctuations. Variation between farm prices and official price quotations is very great with certain commodities, e.g., the official figures for prime clover hay suggest that the 1931 crop realised in the neigbourhood of 70/- per ton, whereas the farm price secured in the eastern counties approximated 40/- per ton.

† Subject to revision.

Feeding stuffs, which in 1930 had fallen to some 4 per cent. below their pre-war cost level, showed, on the whole, a further decline for 1931.

Feeding Stuffs, Prices per Ton

	Middlings (coarse British).	Bran (British).	Barley meal.	Maize meal.	Linseed cake.	Cotton seed cake.
	£	£	£	£	£	£
1911–13	6·60	5·05	7·82	7·12	8·67	5·62
1927	9·10	8·02	11·45	9·05	11·80	7·17
1928	9·20	8·22	11·32	11·05	12·62	8·50
1929	7·77	7·22	9·87	10·35	13·25	7·85
1930	5·75	5·25	6·62	7·47	10·40	5·50
1931	5·82	5·47	6·35	5·45	8·52	5·40
October 1930 ..	5·10	4·35	5·85	6·60	9·00	4·25
November " ..	5·25	5·25	6·00	6·10	8·85	4·25
December " ..	5·60	5·60	5·85	6·10	8·85	4·60
January 1931 ..	5·00	4·85	5·50	5·60	8·85	4·85
February " ..	4·60	4·60	5·60	5·60	8·85	5·25
March " ..	5·00	5·50	6·25	6·25	8·50	5·50
April " ..	5·50	5·25	6·85	6·60	8·00	5·25
May " ..	5·35	4·50	6·75	5·85	7·75	5·10
June " ..	5·25	4·25	6·75	5·25	7·85	4·85
July " ..	5·75	4·75	6·50	5·25	7·75	4·60
August " ..	5·75	4·85	6·25	4·75	7·60	4·50
September " ..	6·10	5·10	6·75	5·60	8·50	5·50

Fertilisers applied to the 1931 crops were purchased at a cost approximating, on the whole, to pre-war levels.

Fertilisers, Prices per Ton

	Sulphate of Ammonia.	Nitrate of Soda.	Superphosphate.	Basic Slag.	Kainit.	Muriate of Potash.
	£	£	£	£	£	£
1911–13 ..	13·45	10·65	2·55	1·72	2·50	—
1927	11·37	12·75	2·85	2·51	2·81	8·95
1928	10·47	10·75	2·61	2·05	3·00	9·30
1929	10·47	9·90	2·90	2·05	3·05	9·20
1930	9·70	9·60	2·99	2·11	3·07	9·25
1931	8·20	9·02	2·86	2·14	3·04	9·05
September 1930	8·95	9·35	3·30	2·05	3·00	9·10
October "	9·05	9·45	3·30	2·05	3·00	9·10
November "	9·15	9·60	3·30	2·05	3·05	9·15
December "	9·25	9·75	3·30	2·05	2·95	9·20
January "	9·45	9·65	2·99	2·14	3·15	9·35
February "	9·55	9·75	2·91	2·14	3·15	9·35
March "	9·55	9·75	2·92	2·14	3·15	9·35
April "	9·55	9·75	2·90	2·14	3·15	9·35

The price of dairy cows and store livestock declined considerably during the year 1931.

Dairy Cows and Store Livestock, Prices per Head .

		Dairy cows, 1st and 2nd quality Shorthorn milkers.	Store cattle, 1st and 2nd quality Shorthorn 1 and 2 year old.	Store sheep, 1st and 2nd quality Down hoggs.	Store pigs, 1st and 2nd quality 8–12 and 12–16 weeks old.
		£	£	s. d.	s. d.
1911–13	.. ..	20·7	11·5	35·11	22 9
1927	.. ..	26·1	14·6	51 11	42 4
1928	.. ..	27·6	14·8	54 6	29 11
1929	.. ..	27·4	14·2	56 2	40 10
1930	.. ..	27·1	15·0	56 1	48 6
1931	.. ..	26·1	14·8	47 1	34 5
October	1930 ..	27·7	15·1	51 2	45 9
November	" ..	28·1	14·7	53 7	45 1
December	" ..	28·1	14·8	54 7	44 6
January	1931 ..	27·8	14·8	54 6	44 11
February	" ..	27·4	14·9	52 10	44 9
March	" ..	26·4	14·8	53 1	42 1
April	" ..	25·9	15·2	55 6	38 9
May	" ..	25·2	15·4	54 8	36 9
June	" ..	24·7	15·5	54 0	33 2
July	" ..	25·8	15·3	46 7	30 0
August	" ..	25·6	15·1	41 8	30 2
September	" ..	25·1	14·3	39 4	29 7

In connection with the cost items of wages, rents, and machinery, official representative figures are not available. It is probable, however, that for the cereal year 1931 wages were approximately double their pre-war level (due weight being given to shorter hours, etc.); that rents were not more than 10 per cent. above the pre-war level*; and that machinery and implements were in the neighbourhood of 65 per cent. above the pre-war level.

Using the "weights" given on page 88, it would appear that the prices of all farm commodities produced in the harvest year 1931 in the six eastern counties to which this investigation refers averaged 30 per cent. above the 1911–13 level, and that the comparable figure for requirements in production was 50 per cent. Thus, in spite of the cheapness of fertilisers and feeding stuffs, the cost of requirements was, on the whole, considerably out of alignment with produce prices. These figures, considered in conjunction with the data presented in Chapter II, section 1, suggest that, in the period 1911–13, the farmers of the district were, on the average, just securing a fair return on their capital and for their own labour.

* See *Jour. Proceed. Agric. Econ. Soc.*, I, 3.

6. PRESENTATION OF RESULTS

In analysing the data collected in this investigation the principal grouping employed has been that of size measured in terms of acres. The various size groups adopted correspond to those on which the official statistics of the country are based, with the exception that farms over 300 acres in size have been subdivided. In all there are six size groups, viz.:—(1) 20–50 acres, (2) 50–100 acres, (3) 100–150 acres, (4) 150–300 acres, (5) 300–500 acres, and (6) over 500 acres. In calculating "over-all" averages for all sizes of farms "weights"* have been introduced based on the total number of farms in each size group in the six counties concerned. In addition to the straightforward grouping by size of holding, analyses are presented based on "locality" groupings. These latter represent groups of farms working under similar soil and marketing conditions. For example, the locality groupings chosen represent respectively: (1) central Norfolk light loam, (2) Norfolk breck, (3) central Suffolk heavy loam, (4) north-east Suffolk sand and gravel, (5) south-east Suffolk and north-east Essex sand and gravel, (6) north Essex boulder clay, (7) south Essex london clay, (8) south Hertfordshire gravels, (9) south Cambridgeshire gravels, and (10) Huntingdon and west Cambridgeshire clays. Each of these districts has distinctive agricultural characteristics, without reference to which no study of eastern counties' farming would be complete.

In discussing the results it has been necessary to introduce certain technical terms. In order that the reader may interpret correctly the significance of the data presented in these pages the terms employed are defined as follows:—

(1) *Financial Year* covers a period of twelve months ending at a date varying with individual farms between the 21st September and the 18th December, 1931.

(2) *Gross Income* is the sum of (*a*) receipts for livestock, livestock products, and miscellaneous sales effected during the financial year; (*b*) receipts for the 1931 crops already sold plus the anticipated crop sales at the prices ruling when the record was taken; and (*c*) the increase in livestock and fodder crop valuations during the financial year. The gross income does not include the value of farm produce consumed by the farmer and his family.

(3) *Gross Charges* comprise (*a*) expenditure on labour (including an allowance at current rates for unpaid family labour other than that of the occupier), foodstuffs, purchases of livestock, and miscellaneous expenses incurred during

* The "weights" employed in computing over-all averages from the size group averages are as follows:—20–50 acre size group = 6; 50–100 acre size group = 5; 100–150 acre size group = 3; 150–300 acres size group = 4; over 300 acre size group = 2.

the financial year; (*b*) expenditure incurred on seeds and fertilisers for the 1931 crops; (*c*) full year's rent; and (*d*) decreases in livestock and fodder crop valuations during the financial year. The gross charges do not include interest payments on loans, interest on the farmer's own capital, nor any allowance for the manual and managerial work of the farmer himself. No credit has been given either for the rental value of, or local rates on the dwelling house, or for material (e.g. coal, paraffin, etc.) drawn out of farm stores for use in the farmer's household.

(4) *Farm Income* is the difference between gross income and gross charges. It should be noted that this figure has been obtained by calculating the difference between the charges incurred during the financial year, and the income realised or anticipated *as a result* of these charges. The farm income is the amount available to defray interest on loans, and to remunerate the farmer for his own labour and capital investment.

(5) *Investment Income* is the farm income less remuneration to the occupier for his own labour. This remuneration is calculated at the rate of £2 per week for manual work, and £4 per week for managerial duties. Where an occupier employs part of his time on manual work and part on managerial duties, the allowance has been calculated *pro rata* to the estimated number of weeks spent on each. Investment income is, therefore, a measure of the return yielded by the capital invested in the farm (not including landlord's capital) on the assumption that *all* labour on the farm has been remunerated.

(6) *Labour Income* is the farm income less 5 per cent. on the mean value of the farm capital. In this connection it should be noted that the farm income has been calculated on the basis of a debt-free undertaking, a condition which, in practice, is far from common. Labour income is, therefore, the return obtained by the occupier to remunerate him for his own labour after interest on the capital invested has been defrayed.

(7) *Profit Surplus* is the farm income less an allowance for the occupier's own labour and less interest at 5 per cent. on the farm capital. Where the profit surplus is a minus figure (i.e. a deficit) it represents the amount by which the farm has failed to make a fair return for the capital invested and for the work of the occupier. Where the profit surplus is a plus figure it represents the amount left over after all legitimate charges have been met.

(8) *Drawings in kind.* In calculating the gross charges no credit has been given to the farm for private drawings in kind. These emoluments are, however, of considerable importance, and comprise such items as house rent, farm produce, fuel and other material consumed by the farmer's household.

In considering any one of the four indices of profitableness (4, 5, 6 and 7 above), it should be borne in mind that an addition must be made to represent drawings in kind.

(9) *Farm Capital* represents the capital invested in livestock, crops, implements and machinery. So far as livestock, implements, and machinery are concerned the farmer's own estimate of their value has been accepted, and the mean of the opening and closing valuations adopted in the analyses. Corn, hay, potatoes, and other crops generally sold have been valued on the basis of the yield and estimated market price; while young seeds, bare fallows, folding and other root crops have been valued at standard rates based on earlier cost investigations. These crop valuations are referred to in later pages as "crops and tenant right."

(10) *Landlord's Capital.* This has been calculated by capitalising the rental value of each holding on the basis of 17 years' purchase for farms under 100 acres, 19 years' purchase for farms between 100 and 300 acres, and 21 years' purchase for farms over 300 acres.

(11) *Capital turnover* represents the ratio between output and capital. It is calculated by expressing the gross output as a percentage of the farm capital.

(12) *Gross Output* represents the gross income less purchases of livestock and valuation decrease. Private drawings in kind should, theoretically, be included in the gross output.

(13) *Net (Social) Output* is the amount accruing to the three partners in the industry, viz: landlord, farmer and labourer. Net output is, therefore, the sum of the gross rent, the farm income, and wages (including family labour other than that of the occupier), and, as such, is a measure of considerable importance. Produce and other material consumed by the occupier's family should, theoretically, be included in the net output.

(14) *Animal (or Livestock) Units* provide a somewhat unsatisfactory index of the livestock density. This measure expresses all types and ages of livestock in one composite index. One animal unit is equal to one horse, bullock, or cow; young stock and other types of livestock are expressed as fractions of one unit.*

* The conversion factors used in the investigation are as follows:—

Horse	= 1·0 A.U.	Ewe, ram	= 0·14 A.U.
Cow	= 1·0	Brood sows	= 0·2
Bull, bullock	= 1·0	Fat pigs	= 0·1
Heifer	= 0·5	100 adult poultry	= 1·0

(15) *Man Equivalent* is a convenient way of measuring the number o workers employed. One man working for one year equals one man equivalent One man working for six months equals 0·5 man equivalent. Juvenile an female workers are expressed as a fraction of adult male workers.

(16) *Crop Index* provides a composite index of the yields of a number o crops weighted by the acreage covered by each. An index of 100 is parity and corresponds with the decennial average for the eastern counties Province Thus a crop index of 90 indicates an average yield, for the crops concerned of 10 per cent. below the 10-year average for the Province.

(17) *Rent.* All the farms have been considered as being occupied b tenants paying rent. Where a farm was occupied by the owner the estimate rental value has been charged against the farm.

(18) *Credit transactions.* All purchases and sales effected during th financial year have been considered as cash transactions, i.e. outstandin debtors and creditors have been omitted from the opening and closing balanc sheets.

(19) *Averages.* In general, the averages presented are weighted, bu simple averages have been introduced where considered advisable.

CHAPTER II

GENERAL FINANCIAL AND ECONOMIC DATA

THE results emerging from this investigation refer to the 1931 crop year, and must therefore be interpreted in the light of prices, costs, and weather conditions affecting agricultural production in that season (see Chap. I). The financial results, particularly profits and losses, must not be assumed to be representative of other than the crop year 1931.

The principal financial and economic data are given by size and locality groups in Table II and III in the Appendix. It is important that the reader should refer direct to these tables for, as might be expected, there are wide variations in the economic organisation and financial results of the different groups, and the general averages presented in Section 1 following must not be considered as applicable to any particular size or type of farm. Further, the reader is urged to make himself familiar with the definitions given in Chapter I (pages 13 to 16) of the various technical terms employed.

1. GENERAL AVERAGES

In each of the size groups the average farm income failed by a very large amount to make a fair return for the capital invested and for the work of the occupier. It would have been necessary for the general price level of farm produce to have been no less than 18 per cent. higher than it actually was (costs remaining constant) in order to provide occupiers with interest at 5 per cent. on their capital, and a cash wage of 48s. per week for their own manual and managerial labour.

In connection with the small proportion of the gross income represented by crops, it must be borne in mind that the 1931 wheat acreage was the smallest on record, while the very low prices obtainable for the 1931 cereals not only directly depressed the proportion of the gross income derived from these crops, but encouraged farmers to withhold supplies from the market, and to feed as much as possible to livestock. Further, a farm (particularly a mixed arable farm) is a highly complex unit, of which the various component departments are closely, and usually subtlely, inter-related. It is necessary in practice to maintain in this unit many departments which are not directly cashable, although the objective of the occupier will be to reduce such departments to a minimum. Thus the figures representing the percentage composition of the gross income provide no indication either (*a*) of the area covered,

(*b*) of the food value produced, or (*c*) of the employment provided by the various crops. On the average less than one-third of the farmed area was devoted to the production of crops for sale, the produce from more than two-thirds being marketed in the form of livestock or livestock products.

The gross income comprised the following items:

Item.	Per cent.	Per cent.
Dairy produce	23·8	
Horned stock	16·3	
Pigs	11·2	
Poultry and eggs	11·2	
Sheep and wool	6·0	
		68·5
Barley	7·9	
Wheat	5·3	
Sugar beet	4·7	
Potatoes	3·8	
Hay	1·9	
Oats	0·7	
Beans and peas	0·6	
Straw	0·6	
Other crops	3·5	
		29·0
Miscellaneous		2·5
Gross income		100·0

The gross charges incurred in producing the gross income were made up in the following proportions:

Item.	Per cent.	Per cent.
Labour	35·7	
Foodstuffs	16·7	
Livestock	13·7	
Rent	13·6	
Implements and machinery ..	3·2	
Seeds	2·8	
Fertilisers	2·7	
		88·4
Miscellaneous		11·6
Gross charges		100·0

The above two tables showing the composition of gross income and gross charges provide the "weights," or proportions, necessary for calculating the effect which changes in price and cost levels of individual products and requirements would exert (*other things remaining equal*) on the income of farmers in the area.*

The Michaelmas value of the farm capital (livestock, harvested and growing crops, implements and machinery) approximated £9½ per acre, and, on the average, was distributed as follows:

	Per cent. of total farm capital.
Livestock	41
Harvested and growing crops ..	40
Implements and machinery ..	19
Total	100

Arable land represented 62 per cent. of the total farmed area, which was distributed in the following proportions:

	Per cent. of total farmed land.
Permanent grass	31·8
Rough grazing	3·2
Temporary grass	13·6
Cereals	31·8
Beans and field peas	2·8
Fallow crops	8·9
Bare fallow	3·7
Other crops	1·2
Buildings, waste, etc.	3·0
Total	100·0

Rents averaged 19*s.* 6*d.*, while the capitalised value of land, buildings, and improvements was £18½ per acre. It should be noted that the rents received by the landlord are the *gross* rents, out of which maintenance, taxation and tithe must be defrayed. The basis on which landlord's capital has been calculated is explained on page 15.

The number of manual workers employed ("man equivalents") averaged 3·1, while the number of horses was 3·2 per 100 acres. Expressed in a single

* See also p. 88.

common denominator (see page 15) the total number of livestock carried per 100 acres of farmed land approximated 18 animal units distributed as follows:

	Per cent. of total livestock units.
Cows, in-calf heifers and bulls ..	35
Other cattle	21
Sheep	10
Pigs	9
Poultry	7
Horses	18
Total	100

The gross output averaged £625 per 100 acres. Expressed on the basis of "per manual worker" (including family labour), this output equals almost exactly £200. The output per £100 farm capital averaged £65, and per £100 landlord's capital £34. The gross output per £100 total capital invested (i.e. landlord's capital plus farm capital) amounted to only £22.

The net (or "social") output approximated £360 per 100 acres, and was distributed between the three partners in the industry in the following proportions:

	Per cent. of total net output.
Labour (including family labour other than that of the occupier)	71
Gross rent	27
Farm income	2
Total	100

2. Size Group Averages

The size grouping adopted is based on superficial area. This basis of classification is unsatisfactory because volume of output is of considerably greater economic significance than is unit of area. Output is a composite measure of intensity of production and the productive area, and, as such, would appear to be the best basis for expressing the size of a farm business.

An analysis of the economic and financial data by size of farm (measured in terms of acres) is given in Table II in the Appendix. There is, of course, a wide variation between the averages (whether expressed on the basis of "per farm" or "per acre") of the different size groups. Production on the

smaller farms was more intensive than that on the larger farms; the farm capital, output per acre, and density of employment in the different size groups being as follows:

Size group (acres).	Farm capital per acre. (£).	Gross output per acre (£).	Manual workers per 100 acres (No.).
20–50	13·4	10·1	5·6
50–100	10·8	7·4	4·2
100–150	10·3	7·0	3·6
150–300	9·3	5·9	2·8
300–500	8·3	4·9	2·3
Over 500	8·1	4·8	2·4

The greater intensity of production on the smaller farms was accomplished by concentrating on livestock enterprises:

Size group (acres).	Livestock units per 100 acres. (No.).	Income from livestock and their products as a % of gross income. (%).	Expenditure on feeding stuffs as a % of gross charges. (%).
20–50	28·1	76	27
50–100	21·1	75	18
100–150	19·8	70	17
150–300	17·4	68	16
300–500	14·2	65	12
Over 500	14·2	60	12

But the larger farms, in spite of their greater dependence on low priced cereals, and in spite of their lower capital turnover, achieved a higher output per £100 manual labour than the smaller farms:

Size group (acres).	Capital turnover, (%).	Sales of cereals as a % of gross income (%).	Gross output per £100 manual labour (£).
20–50	76	9	187
50–100	69	12	183
100–150	68	12	203
150–300	64	14	212
300–500	58	18	215
Over 500	60	21	215

The incidence of the occupier's own labour, and of interest on the farm capital, varies largely between farms of different sizes, and due weight must

be given to this fact when interpreting the profit indices of the various size groups. On the smaller farms remuneration for the occupier's own labour is of much greater importance than the return on the capital invested, but as the size of the farm increases interest on capital assumes ever greater significance:

Size group (acres).	Allowance for occupier's own labour (£ per farm).	Interest at 5% on farm capital. (£ per farm).	Ratio of allowance to interest.
20–50	107	24	4½:1
50–100	116	40	3 :1
100–150	123	65	2 :1
150–300	138	101	1½:1
300–500	158	163	1 :1
Over 500	148	308	½:1

With small farms, therefore, the return obtained by the occupiers for their own labour (i.e. the "labour income") is the most important measure of success, while for large farms, particularly those over 500 acres in size, the return yielded by the capital invested (i.e. the "investment income") is the better criterion of profitableness.

Attention has been drawn to the higher output per acre on the smaller farms, but it must be borne in mind that, from the aspect of profitableness, output *per farm* is the more significant figure. The occupier of a farm cannot hope to secure an adequate income unless the *total* volume of his output is sufficient to leave him, on what must generally be a small profit margin, a net balance sufficient to recompense him for his labour and capital investment. While it is the case that a large surplus cannot be expected from a small business, it is equally true that a small business provides less opportunity for realising a large deficit:

Size group (acres).	Amount (£) by which farm income was less than (−) or exceeded (+) the sum necessary to make a fair return on the capital invested and for the work of the occupier.		
	Average.	Range:—	
		From (−)	To (+).
	£	£	£
20–50	(−) 103	600	500
50–100	(−) 156	700	600
100–150	(−) 166	800	800
150–300	(−) 244	1100	900
300–500	(−) 345	1800	1100
Over 500	(−) 516	2300	1100

That a large business can survive on a smaller profit margin than a small business is a generally accepted theory. The following figures illustrate this as it applies to the sample under investigation:

Size group (acres).	Gross output per farm.	Per cent. profit margin on each unit of output necessary to defray interest on capital and allowance for occupier's own labour.	Per cent. by which actual prices secured for each unit of output failed to provide necessary profit margin.
	£	%	%
20–50	365	36	28
50–100	550	28	28
100–150	885	21	19
150–300	1292	18	19
300–500	1901	17	18
Over 500	3694	12	14

The net (or "social") output has been described as "a standard of judgment for the whole agricultural community—for the amount of the net output determines the limit of possible incomes."* On the farms comprising the present sample the amount and distribution of the net output was as follows:

Size group (acres).	Net output (£):—		Percentage distribution of net output:—		
	Per farm.	Per acre.	Labour.	Gross rent.	Farm income.
20–50	191	5·3	57	28	15
50–100	310	4·2	70	30	0
100–150	516	4·1	70	26	4
150–300	749	3·4	74	27	(—) 1
300–500	1140	2·9	74	28	(—) 2
Over 500	2151	2·8	79	24	(—) 3

3. Locality Group Averages

When generalisations are made in connection with agricultural conditions in the eastern counties it is customary to distinguish broadly between the principal soil types (e.g. clay, loam, or gravel) of the district.† It is not always appreciated, however, that within each of these soil categories there are enormous variations in texture and fertility, which, combined with widely

* Ashby, *Scot. Jour. Agric.*, October, 1923.

† It should be noted that fen and silt soils, which form an important agricultural area in the Province, are not represented in this investigation.

varying marketing facilities, profoundly influence farm organisation, productivity, and profitableness. In selecting the locality groups adopted in the present investigation the objective has been to distinguish these finer economic and geological differences, but, on account of the small number of farms by which certain of the localities are represented, variations between one group and another should be accepted with caution. The progress of the investigation will do much to confirm or disprove the comparisons drawn in this first *interim* Report.

Ten localities, each posssessing certain characteristic soil and marketing conditions, have been selected for comparison:

(1) *Central Norfolk Light Loam* is typically rural, and comprises a light easily worked soil.

(2) *Norfolk Breck* lies round Thetford, and is characterised by a light infertile sandy soil which will not hold water. It is remote from any large urban centre.

(3) *Central Suffolk Heavy Loam* contains much typical clay. There are no large centres of population.

(4) *North-East Suffolk Sand and Gravel* is a light poor soil fringing the coast from Lowestoft to Aldeburgh. Apart from the summer season, when visitors crowd the holiday resorts, production is carried out for distant markets.

(5) *South-East Suffolk and North-East Essex Sand and Gravel* form part of the same belt as district (4), but a less permeable subsoil, and a greater clay content, render it much more fertile. Ipswich and Colchester provide large consuming centres for much of the produce of the district.

(6) *North Essex and South-West Suffolk Boulder Clay* is of a very heavy nature, and is locally reputed to be unsuited to grass. There is little opportunity for diversification of cropping, while markets are remote.

(7) *South Essex London Clay* practically adjoins the Metropolis. This area possesses decided marketing advantages, while the nature of the soil favours permanent grass.

(8) *South Hertfordshire Gravel* is favoured with unrivalled marketing facilities owing to the development of residential suburbs and manufacturing centres.

(9) *South Cambridgeshire Gravel* is ill served by beet factories, and has no adjacent urban centre. The soil is light and responsive.

(10) *West Cambridgeshire and Huntingdonshire Clay* provides soil and marketing conditions very similar to those in north Essex, except that oxford clay and gault occur alongside the boulder clay. The soil is intractable, and consuming centres are distant.

The principal financial and economic data relating to the different localities are presented in Table III in the Appendix. Startling variations are evident even between closely adjacent localities. As might be expected, the larger farms (measured in terms of acres) are found on the poorer soils, furthest from urban centres. The heaviest losses were made on the clays of north Essex, Huntingdon and west Cambridge, the central Suffolk heavy loams, the central Norfolk light loams, and the gravels of north-east Suffolk and south Cambridge. The least unprofitable districts were the south-east Suffolk and north-east Essex gravels, the south Essex london clays, and the south Hertfordshire gravels. There is a difference of nearly £300 in the *average* net income per farm on the most and least unprofitable district.

Large variations in intensity of production occur between the different areas. The following figures show capitalisation and density of employment arranged in descending order of gross output per 100 acres.

District.	Per 100 acres farmed land.		
	Gross output (£).	Farm capital (£).	Manual workers (No.).
S.E. Suffolk & N.E. Essex gravels ..	891	1168	4·0
S. Herts. gravel	777	950	3·3
S. Essex l. clay	719	976	2·4
Cent. Norfolk light loam	649	1088	3·7
S. Cambs. gravel	607	961	3·0
Cent. Suffolk heavy loam	524	973	3·4
N. Essex and S.W. Suffolk b. clay ..	477	791	2·9
N.E. Suffolk gravel	439	702	2·6
Hunts. & W. Cambs. clay	404	738	2·3
Norfolk breck	344	638	1·9

Intensity of production is more than 2½ times as great on the south-east Suffolk gravels as on the Norfolk breck.

The proportion of arable land, of cereals grown, and of crops cashed direct (i.e. not marketed in the form of livestock or livestock products) is shown in the following table:

District.	Per 100 acres farmed land.		
	Arable land.	Cereals (acres).	Crops sold* (acres).
S. Cambs. gravel	86	47	47
N. Essex and S.W. Suffolk b. clay ..	76	41	40
Cent. Suffolk heavy loam	72	38	28
Cent. Norfolk light loam	69	36	31
S.E. Suffolk & N.E. Essex gravel ..	61	30	22
Hunts. and W. Cambs. clay	61	29	32
N.E. Suffolk gravel	51	24	21
Norfolk breck	50	24	22
S. Herts. gravel	45	24	22
S. Essex l. clay	23	8	12

It will be noted, for example, that on the north Essex boulder clay three-quarters of the farmed land is under the plough, and that crops from 40 per cent. of the farmed area have been cashed direct, while on the south Essex london clay only one-quarter of the farmed land is under the plough, and the produce from all but 12 per cent. of the farmed area has been marketed in the form of livestock or livestock products. The proportion of the farmed land devoted to cereals varies from nearly one-half on the south Cambridgeshire gravels and the north Essex boulder clays to less than one-tenth on the south Essex london clays. On the north Essex boulder clays the proportion under wheat alone bulks largest at 18·4 per cent. of the farmed land, while the other extreme is provided by the Norfolk breck with only 3·1 per cent. of the area under wheat.

The greatest density of livestock is found on the south Essex london clay, which forms the principal dairying district in the Province. Here dairy cattle (cows, in-calf heifers, and bulls) represent approximately half the total livestock, and are carried at the rate of just over 13 per 100 acres. In order of importance the gravels of south Hertfordshire, south-east Suffolk and north-east Essex, and the central Norfolk light loams come next as dairying districts.

In each of the ten districts livestock and their products are responsible for the greater proportion of the gross income. Some idea of the importance to the different districts of the various types of produce will be obtained from

* This refers to all crops sold, including hay.

Table III in the Appendix,* which also provides a basis for estimating the effect which changes in price levels are likely to exert on net incomes of farmers in the different localities. Here it may be mentioned, however, that, expressed as a percentage of the gross income, the *relative* importance of dairy produce

District.	Per 100 acres of farmed land:— Capital invested in livestock (£).	Dairy cattle (No.).	Sales of livestock and livestock products. (£).
S. Essex l. clay	586	13·5	700
S.E. Suffolk & N.E. Essex gravel	515	8·2	723
Cent. Norfolk light loam	452	7·4	567
S. Herts. gravel	438	9·4	637
Cent. Suffolk heavy loam	371	4·5	431
S. Cambs. gravel	295	2·7	385
Hunts. & W. Cambs. clay	283	3·1	260
Norfolk breck	282	3·2	268
N. Essex and S.W. Suffolk b. clay..	262	2·9	317
N.E. Suffolk gravel	257	4·6	361

is greatest on the south Essex clays; of horned stock on the central Norfolk light loams; of pigs in central Suffolk; of poultry and eggs on the north Essex clays; of sheep on the Norfolk breck; of wheat on the north Essex clays; and of barley on the south Cambridge gravels.

District.	Per cent. of gross income represented by:— Livestock and their products.	Crops.	Miscellaneous.
S. Essex l. clay	86	12	2
S. Herts. gravel	73	21	6
S.E. Suffolk & N.E. Essex gravel ..	73	25	2
Cent. Suffolk heavy loam	71	28	1
Cent. Norfolk light loam	70	28	2
Norfolk breck	68	29	3
N.E. Suffolk gravel	68	30	2
N. Essex and S.W. Suffolk b. clay..	60	38	2
Hunts. and W. Cambs. clay ..	59	39	2
S. Cambs. gravel	52	46	2

* See also page 89.

CHAPTER III

LIVESTOCK

As has been shown in the preceding chapter, livestock form the principal element in the agricultural economy of the Province, although the interdependence of livestock and crops must be prominently borne in mind (see page 63). Capital invested in livestock comprises 41 per cent. of the total Michaelmas valuation, while sales of livestock and their products furnish 68 per cent. of the gross farm income. Livestock density averages 18 animal units* per 100 acres, but as is indicated by the following table, this figure is subject to wide variation between the various size groups, and between individual farms in each size group.

Size group (acres).	Percentage of farms having a livestock density* of:—		
	Less than 15 A.U.	15–24 A.U.	Over 24 A.U.
20–50	14	28	58
50–100	24	41	35
100–150	32	39	29
150–300	38	41	21
300–500	52	33	15
Over 500	54	40	6

Further, during 1931, livestock was closely connected with the profitableness of the individual farm, and this relationship is illustrated below.

Size group (acres).	Profit surplus (£) on farms having a livestock density* of:—		
	Less than 15 A.U.	15–24 A.U.	Over 24 A.U.
20—50	—125	—143	— 79
50—100	—196	—189	— 92
100—150	—239	—179	— 72
150—300	—320	—277	— 55
300—500	—540	—240	+ 12
Over 500	—683	—485	+923

The favourable influence of livestock on profits was aided by the low price of feeding stuffs. But as a comparison of the price levels of feeding stuffs and livestock for the six months January to June 1931 and 1932 indicates an 18 per cent. rise in the former and a 13 per cent. fall in the latter, it is

* Density of livestock is expressed in terms of animal units per 100 acres of crops and grass. "A.U." stands for Animal Unit (see definition on p. 15).

certain that the comparative advantage hitherto enjoyed by livestock producers is now largely discounted.

The distribution of the gross income from livestock is shown in the following figures:—

Size group (acres).	Percentage of farms selling livestock and livestock products to the value of:—					
	£1–100.	£101–300.	£301–500.	£501–1000.	£1001–1500.	Over £1500.
20–50	17	48	19	12	3	1
50–100	8	37	23	24	4	4
100–150	3	19	25	32	15	6
150–300	3	11	12	35	21	18
300–500	2	5	15	19	15	44
Over 500	—	3	—	11	11	75

During 1931 there was a tendency to increase livestock commitments, a development mainly due to low cereal prices. Increases in the head of poultry and pigs have been especially marked.

1. DAIRY ENTERPRISE

The principal data relating to the dairy enterprise are presented on page 30. For all sizes of farms, dairy cattle account for just under 35 per cent. of the total livestock (measured in terms of "animal units"), while approximately 24 per cent. of the gross farm income, and 35 per cent. of the gross income from all livestock enterprises, is derived from sales of dairy produce. On the basis of capital investment and cash sales, dairying thus appears to be the most important individual enterprise in the rural economy of the district.

Of all farms over 20 acres in extent, 14 per cent. had no cows; 39 per cent. had 1–4 cows; 23 per cent. had 5–9 cows; and 24 per cent. had 10 or more cows. The average number of cows per farm ranged from 3·3 on farms of 20–50 acres, up to 16·7 on farms of over 300 acres.

The distribution of dairy produce sales in the different size groups is given below, and it will be observed that three-quarters of all farms sold at least some dairy produce, while nearly one-fifth sold more than £500 worth.

Size group (acres).	Percentage of farms selling dairy produce to the value of:—						
	£0.	£1–100.	£101–300.	£301–500.	£501–1000.	£1001–1500.	Over £1500.
20–50	32	41	15	7	3	2	—
50–100	25	36	19	9	8	2	2
100–150	22	28	18	11	12	7	1
150–300	25	21	15	9	18	9	3
Over 300	33	21	13	7	10	7	9

DAIRY ENTERPRISE DATA

(*a*) GROUPED BY SIZE OF FARM.—RELATING TO 983 FARMS.

Size group (Acres)	No. of farms	Percentage of farms having				Av. no. of cows		Capital value per cow (£)	Milk yield per cow (gall.)	Percentage of total yield				Av. price* received per gall. sold (d)	Sales of dairy produce per cow (£)	Income from D.P. sales as % of gross income
		0 Cows	1–4 Cows	5–9 Cows	10 or more Cows	per farm	per 100 acres			Sold as whole milk: Wholesale	Sold as whole milk: Retail	Sold manufactured	Not sold			
20–50	189	22	51	20	7	3·3	9·3	21·5	661	30·8	25·6	32·2	11·4	14·02	34·22	25·9
50–100	262	13	42	27	18	7·7	7·5	21·2	678	45·6	24·0	21·2	8·8	14·32	36·92	30·1
100–150	157	11	31	28	30	8·1	6·4	20·9	655	61·7	15·9	14·3	8·1	14·24	35·71	24·8
150–300	229	10	28	21	41	11·5	5·3	21·4	607	69·0	14·6	10·0	6·4	14·18	33·53	24·4
300–500	109	10	36	16	38	12·5	3·2	21·6	625	71·1	11·7	9·2	8·0	14·20	34·03	18·5
Over 500	37	8	19	19	54	22·5	2·9	21·5	632	75·1	11·7	6·8	6·4	14·17	34·94	17·3

(*b*) GROUPED BY SIZE OF FARM.—RELATING TO 261 FARMS HAVING 10 OR MORE COWS.

Size group (Acres)	No. of farms	Av. no. of cows per farm	Capital value per cow (£)	Milk yield per cow (gall.)	Percentage of total yield				Av. price* received per gall. sold (d)	Sales of dairy produce per cow (£)	Receipts for dairy produce as a % of		Percentage of herds milk recorded		Percentage of herds producing reg. grade milk	Total no. of bulls for all herds in group†
					Sold as whole milk: Wholesale	Sold as whole milk: Retail	Sold manufactured	Not sold			Cattle + dairy produce sales	Gross farm income	Officially	Privately		
20–50	13	13·1	23·5	664	74·1	21·9	0·4	3·5	16·4	43·9	91·6	71·9	—	15·4	—	1P+ 7C
50–100	46	15·4	22·4	702	64·6	29·5	2·1	3·8	16·7	47·1	89·8	63·5	8·7	6·5	—	9P+28C
100–150	46	18·2	21·0	656	78·5	12·4	5·0	4·1	14·9	39·1	83·4	54·2	13·0	—	2·2	6P+32C
150–300	95	22·1	22·2	625	78·7	13·2	4·1	4·0	14·5	36·2	81·4	42·5	16·8	15·8	1·0	39P+62C
300–500	41	28·4	23·1	634	78·9	11·4	5·8	3·9	14·4	36·5	76·0	38·8	26·8	9·8	4·9	26P+27C
Over 500	20	38·6	21·7	634	78·0	11·9	4·8	5·3	14·4	35·9	69·4	26·6	30·0	30·0	5·0	12P+17C

(*c*) GROUPED BY SIZE OF HERD.—RELATING TO 983 FARMS.

Size of herd (Cows)	No. of farms	Av. no. of cows per farm	Capital value per cow (£)	Milk yield per cow (gall.)	Percentage of total yield				Av. price* received per gall. sold (d)	Sales of dairy produce per cow (£)	Receipts for dairy produce as a % of		Percentage of herds milk recorded		Percentage of herds producing reg. grade milk	Total no. of bulls for all herds in group†
					Sold as whole milk: Wholesale	Sold as whole milk: Retail	Sold manufactured	Not sold			Cattle + dairy produce sales	Gross farm income	Officially	Privately		
0	132	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1–4	364	2·4	20·9	629	4·7	13·3	51·3	30·7	9·6	17·4	14·0	3·4	—	0·3	—	6P+31C
5–9	225	6·8	21·1	615	25·6	25·5	37·0	11·9	12·9	29·1	56·8	18·8	0·9	1·8	—	25P+60C
10–19	146	13·5	21·7	769	62·2	22·1	9·9	5·8	15·0	45·2	74·2	35·8	9·0	7·0	0·7	38P+81C
20–29	68	23·6	22·5	678	71·8	21·7	3·1	3·4	15·6	42·5	81·7	43·7	26·5	7·4	—	26P+51C
30–39	20	32·8	23·1	649	91·6	4·7	0·6	3·1	14·5	38·0	88·0	53·5	20·0	35·0	5·0	10P+10C
40–49	14	42·4	21·7	616	91·0	5·0	—	4·0	14·0	34·5	85·0	39·7	21·4	35·7	7·1	8P+12C
50 & over	14	66·6	23·6	649	92·9	4·0	0·1	3·0	14·4	37·8	83·4	54·4	35·7	21·4	14·3	11P+19C

* Includes milk sold as butter, cream and cheese.

† P = pedigree, C = commercial.

As 10 cows may be considered a "one man unit," and as herds with at least 10 cows cover probably 70 per cent. of the dairy stock in the Province, special reference may be made to the dairy enterprise on these farms. Two hundred and sixty-one farms in the sample carried 10 or more cows, and on these the size distribution of herds is as follows:—

Size of herd (cows).	Percentage of total herds.
10–19	55½
20–29	26
30–39	7½
40–49	5½
50 and over	5½
Total herds ..	100

The average milk yield of these herds, calculated on the basis of *full year cows*, was 643 gallons per cow, individual herd yields ranging from 300 to 1200 gallons per cow. The distribution of milk yields is given below, where it will be seen that while 50 per cent. of farms with less than 10 cows showed a yield of over 600 gallons per cow, as much as 60 per cent. of herds of 10 or more cows yielded this amount. Although these yields may appear high, it must be borne in mind that (1) they have been calculated on the basis of full year cows, and (2) the average yield in the eastern counties is higher than in any other district in England. (See *Agric. Output*, 1925, p. 64.) In connection with herd yields it must be emphasised that the main concern of the farmer is to secure from *each cow* a yield which approximates the herd average, rather than to maintain an apparently satisfactory herd average from an admixture of high and low yielding cows.

Milk yield per cow (gallons).	Farms with less than 10 cows. (%).	Farms with 10 cows or more (%).
Under 300	1·7	0·8
300–399	7·7	4·7
400–499	15·3	10·3
500–599	22·8	24·1
600–699	21·1	27·7
700–799	12·5	19·0
800–899	10·0	9·9
900–999	5·6	2·7
1000 and over	3·3	0·8
	100·0	100·0

On 28 per cent. of herds with 10 or more cows, milk recording was practised either privately (11 per cent.), or officially (17 per cent.); only 1 per cent. of farms with less than 10 cows recorded milk yields. A registered grade milk was produced in none of the latter herds, and only in 2 per cent. of the former. The average yield per cow in recorded herds was 673 gallons, as compared with 623 gallons where no records were kept.

In herds of 10 or more cows, there was one bull for every 22 cows, and of these bulls only one-third were described as pedigree stock. As the normal capacity of a bull is about 70 cows, the above proportion suggests considerable scope for some form of co-operative bull ownership, particularly in the light of the fact that bulls were kept on no less than a fifth of farms with under 10 cows. On farms using pedigree bulls the yield per cow averaged 655 gallons, compared with 634 gallons where non-pedigree bulls were used.

Replacement of cows took place at the rate of approximately one-fifth of the herd per annum; 22 per cent. of the average number of cows being drafted in during the year, and 18 per cent. being drafted out. There was, therefore, a tendency to increase the numbers of dairy stock. Contrary to expectation there appeared to be no difference in the rate of replacement in recorded and non-recorded herds. Included in the number drafted out are those lost by death which approximate 2 per cent. of the average number of cows kept. Of cows drafted in, 48 per cent. were bred on the farm and 52 per cent. purchased. Small farms were more dependent on purchased stock than large farms, for while occupiers of under 50 acres purchased 79 per cent. of replacements, those farming 500 acres and over bought only 20 per cent.

Size group (acres).	Home-bred heifers as a % of total numbers drafted into milking herd.
20–50	21
50–100	23
100–150	48
150–300	61
300–500	72
Over 500	80

The mean capital value per cow was just over £21, while depreciation (calculated by subtracting the sum of the cow sales and the closing valuation of the milk stock from the opening valuation plus cows drafted into the herd) amounted to 48s. per cow. In the light of the decline in cow prices associated with the year 1931 this figure for depreciation is unexpectedly low.

Probably the most important factor influencing profits in a dairy herd is the method of disposing of the milk. For all farms together, disposal of dairy produce was effected in the following proportions:—

	Percentage of total production.
Whole milk sold wholesale	57·5
Whole milk sold retail	18·1
Sold manufactured	16·1
Consumed on farm	8·3
	100·0

On farms of 20–50 acres, 31 per cent. of the yield was sold as whole milk at wholesale prices, 25½ per cent. was sold as whole milk at retail prices, 32 per cent. was sold as butter, cream or cheese, and the remainder was consumed on the farm. On farms over 300 acres in size, 72 per cent. of the total yield was sold wholesale, and approximately 12 per cent. and 8 per cent. retailed and manufactured respectively. In herds of 10 or more cows, less than 6 per cent. of the total yield was manufactured in any size group (average = 3·2 per cent.), while farms under a 100 acres retailed a greater proportion of their yield (25 per cent.) than those over 300 acres (11½ per cent.). On farms with 10 or more cows the average price received (wholesale and retail combined) was 14·9*d.* per gallon of milk sold (butter, cream and cheese expressed as milk), but prices ranged from as low as 6*d.* to as high as 2*s.* 2*d.* a gallon. On account of the larger amount manufactured in the smaller herds the average price per gallon obtained in herds with less than 10 cows was only 11·7*d.* per gallon compared with an average for all herds of 14·2*d.* per gallon. In herds of 10 or more cows just over 98 per cent. of the receipts for dairy produce comprised whole milk, and butter and cream were of little importance, representing only 1·6 per cent. and 0·2 per cent. respectively. Compared with these figures farms with less than 10 cows derived 75·3 per cent. of the total receipts for dairy produce from whole milk, 23·6 per cent. from butter and 1·1 per cent. from cream. Eight per cent. of farms keeping cows sold over 1000 lb. of butter, and three quarters of these had less than 10 cows. The average receipts per cow on farms selling over 1000 lb. of butter was only £17·6, a figure which compares with £35 per cow for all herds. Practically no cheese was sold. The average price received for butter was 1*s.* 5½*d.* per lb., and for cream 2*s.* 1*d.* per pint. At these prices milk* was worth 5·8*d.* per

* On the assumption that it requires three gallons of milk to make one pound of butter and twelve gallons of milk to make one gallon of cream.

gallon as butter, and 1s. 3¾d. per gallon as cream, exclusive of cost of manufacture, and not allowing for skim and butter milk.

The most important dairying districts are found in south Essex, in south Hertfordshire, in north-east Essex and south-east Suffolk, and in central Norfolk. Particulars of the dairy enterprise in these four localities are given below :—

	Per 100 acres.		Percentage disposal of milk.				*Av. price received per gall. sold.
	Dairy cattle.	Income from sales of dairy produce.	Sold as whole milk.		Sold. manuf'd.	Not sold.	
			Whole-sale.	Retail.			
	No.	£	%	%	%	%	d.
South Essex london clay ..	13·5	395	88	8	—	4	14·9
South Hertfordshire gravel ..	9·4	382	61	33	2	4	18·5
North-east Essex and south-east Suffolk gravel ..	8·2	299	66	24	4	6	16·3
Central Norfolk light loam ..	7·4	162	56	7	28	9	10·8

The above figures illustrate admirably the diverse marketing facilities of the different localities. In the south Essex london clay area 88 per cent. of the total yield is sold wholesale as whole milk, 8 per cent. is sold retail as whole milk, and an insignificant proportion is manufactured. In south Hertfordshire 61 per cent., and in north-east Essex and south-east Suffolk 66 per cent., of the total yield is sold wholesale, while in the former district no less than 33 per cent., and in the latter 24 per cent., is sold retail. In the above areas the amount of milk sold manufactured is unimportant, but in central Norfolk, which is remote from urban centres, as much as 28 per cent. of the total production is manufactured, and only 7 per cent. is sold retail. There is a close connection between the method of disposal and selling price, and it will be noticed that producers in central Norfolk averaged only 10·8*d.* per gallon,* as compared with 14·9*d* in south Essex, 16·3*d.* in north-east Essex and south-east Suffolk, and as much as 18·5*d.* in south Hertfordshire.

2. HORNED STOCK

Over all sizes of farms the income from sales of horned stock amounted to just over 16 per cent. of the gross farm income. Of this sum approximately two-thirds (or 11 per cent. of the gross farm income) was derived from sales of feeding cattle (i.e. fat or store stock), while the remaining third comprised

* Butter, cream and cheese expressed as milk.

sales of breeding stock, cast cows, and calves. The distribution of the sales of horned stock is shown below. Only 8 per cent. of all farms sold over £500 worth, and of these nearly one-half were at least 300 acres in extent.

Size group (acres).	Percentage of farms selling horned stock to the value of:—						
	£0.	£1–100.	£101–300.	£301–500.	£501–1000.	£1001–1500.	Over £1500.
20–50	21	66	11	2	—	—	—
50–100	13	56	25	5	1	—	—
100–150	10	47	27	9	6	—	1
150–300	9	30	37	10	10	3	1
300–500	5	17	31	18	17	6	6
Over 500	5	8	22	8	43	8	6

It is somewhat difficult to assess the real importance of feeding cattle (as distinct from dairy and breeding stock), for farms which are concentrating primarily on dairy produce frequently hold bull calves for sale as stores or beef, or fatten for slaughter heifers which are, for one reason or another, not suitable for breeding purposes. Sales of horned stock exceeded the sales of dairy produce on 40 per cent. of farms, this proportion ranging from 30 per cent. on the 20–50 acre size group to 60 per cent. on farms over 300 acres.

Feeding cattle were kept to a greater or lesser extent on approximately 50 per cent. of all farms; on 40 per cent. of farms between 20–50 acres, and on 70 per cent. of farms of 300 acres or over. The mean valuation of feeding cattle in hand at the date of valuation was £13¼. Stock sold during the year realised an average price of £20¼ per head, and stores were brought in at £12¼. Two-thirds of farms with feeding cattle were wholly dependent on purchased stores, the remainder rearing either part or all of their requirements. As might be expected, small farms were more dependent on purchased stores than large.

3. PIGS

Pig-keeping in the eastern counties has developed as a subsidiary enterprise to cereal production, and the district carries a denser pig population than any other part of the Kingdom. The income from pig sales represents over 11 per cent. of the gross income of all farms in the district, and at 1931 prices was equal to that obtained from poultry and eggs and twice that obtained from wheat. The distribution of pig sales by size of farm is given below. On farms between 20–50 acres, 17 per cent. of the gross farm income was derived from pig sales, and in this group pig-keeping was second in

importance only to the dairy enterprise. Seventeen per cent. of farms of more than 300 acres in extent sold at least £500 worth of pigs.

Size group (acres).	Percentage of farms selling pigs to the value of:—						
	£0.	£1–100.	£101–300.	£301–500.	£501–1000.	£1001–1500.	Over £1500.
20–50	31	47	17	4	1	—	—
50–100	23	52	19	3	3	—	—
100–150	23	37	32	6	1	1	—
150–300	30	30	28	4	6	1	1
300–500	18	28	35	9	6	3	1
Over 500	24	11	16	11	24	11	3

Pigs were kept on 79 per cent. of all farms in the area, on 76 per cent. of farms of 20–50 acres in size and on 83 per cent. of those above 300 acres. Eighty per cent. of farms with pigs kept sows, and on these the average number of sows per holding was 4·3, ranging from 2·5 in the 20–50 acres group to 9·1 on farms over 300 acres. The size distribution of herds is given below:—

Size group (acres).	Percentage of farms keeping sows to the number of:—				
	0.	1–2.	3–6.	6–12.	Over 12.
20–50	44	33	21	2	—
50–100	36	32	25	7	—
100–150	29	32	27	10	2
150–300	36	18	31	9	6
300–500	27	16	27	23	7
Over 500	24	11	24	14	27

The average number of pigs reared per sow per annum was 12·9, a figure which appears surprisingly high as it has been ascertained, from data collected in the East Anglian Pig Recording Scheme, that an average of only 10·6 pigs were reared by 841 recorded sows during the year March 1930–31.

The following data relates to the pig enterprise on farms keeping sows:

Size group (acres).	Percentage of farms keeping sows.	No. of sows per farm.	Pigs reared per sow per annum.	Percentage of farms keeping boars.
20–50	56	2·5	13·3	18
50–100	64	3·7	13·4	27
100–150	71	3·8	12·7	41
150–300	64	5·1	12·7	56
300–500	73	7·0	13·0	66
Over 500	76	15·1	12·7	75

Eighteen per cent. of the average number of sows maintained were discarded during the year, while 34 per cent. were drafted in. In spite of low prices for pork and bacon there was, therefore, an increase over the year of approximately 16 per cent. in the number of sows kept. This increase probably occurred during the first six months of the year, when, taking into account the low price of feeding stuffs, pig-keeping even at 14s. a score was moderately profitable. In the latter half of the twelve months a fall in pig prices, coincident with a rise in feeding costs, rendered a policy of further expansion unprofitable. On the basis of an annual discard of 18 per cent., the herd life of a sow is 5½ years, i.e. each sow would produce 9 or 10 litters. Rate of replacement is subject, however, to wide annual fluctuations, as in a period of satisfactory prices even old sows are retained indefinitely in the herd, while during a period of low prices, comparatively young sows may be slaughtered. As it has been shown that the reproductive capacity of sows is not impaired up to the 10th litter, 5½ years would appear to be the most economic length of life for a breeding sow. Of sows drafted into the herd, approximately one half were home-bred. Boars were kept on 34 per cent. of farms keeping sows, and over all farms there was an average of one boar to eleven sows.

4. SHEEP

Over all farms in the district sales of sheep and wool represent 6 per cent. of the gross farm income, but this source of revenue is important only on the larger farms.

Size group (acres).	Percentage of farms selling sheep and wool to the value of:—						
	£0.	£1–100.	£101–300.	£301–500.	£501–100.	£1001–1500.	Over £1500.
20–50	97	1	1	1	—	—	—
50–100	91	4	4	1	—	—	—
100–150	84	6	7	2	1	—	—
150–300	65	7	18	6	3	1	—
300–500	51	8	19	7	10	4	1
Over 500	27	11	13	14	19	8	8

Sheep were kept on 21 per cent. of all farms; on less than 4 per cent. of farms between 20–50 acres, and on 56 per cent. of farms of 300 acres and over. One-third of the farms of more than 500 acres sold over £500 worth of sheep and wool.

Approximately 14 per cent. of all farms (or 68 per cent. of farms with sheep) maintained a breeding flock. The size distribution of these flocks was as follows:—

Size of flock (ewes).	Percentage of total ewe flocks.
Less than 50	45
50–99	28
100–149	11
150–199	5
200–249	6
250 and over	5
	100

The lamb crop on individual farms ranged from as low as 0·5 to as high as 1·8 lambs per ewe, with an average of 1¼. Twenty-three per cent. of ewes were discarded during the year, and 40 per cent. were drafted into the herd. Over all farms there was one ram to every 45 ewes. Data relating to breeding flocks is given below:

Size of farm.	Percentage of farms keeping ewes.	No. per flock		Ewes per ram.	Lambs per ewe.
		Ewes.	Rams.		
20–50	—	—	—	—	—
50–100	6	23	0·6	37	1·28
100–150	10	58	1·2	50	1·26
150–300	29	62	1·4	44	1·27
300–500	41	88	1·9	47	1·23
Over 500	65	215	4·6	48	1·20

5. POULTRY

Poultry stocks in England and Wales have more than doubled since 1924, and the industry now assumes an important place in the rural economy of the country. In the district covered by the present survey, the income from poultry and egg sales in 1931 amounted on the average to 11 per cent. of gross farm incomes, and was equal to the sales of pigs, and rather more than twice those of wheat. Ninety-two per cent. of all farms kept poultry, but the proportion is slightly higher on the small farms than on the large. Of the total receipts from poultry, eggs represent two-thirds and birds

one-third. The distribution of the receipts from poultry is shown in the following table:—

Size group (acres).	Percentage of farms selling poultry and eggs to the value of:—						
	£0.	£1–100.	£101–300.	£301–500.	£501–1000.	£1001–1500.	Over £1500.
20–50	14	69	12	3	1	—	1
50–100	7	74	14	2	2	—	1
100–150	14	60	19	5	1	—	1
150–300	11	52	30	2	3	1	1
300–500	12	46	34	5	2	—	1
Over 500	16	35	35	3	11	—	—

On the farms which kept poultry the average size of flock was 211 birds, and of these 42 per cent. were hens, 38 per cent. pullets and 11 per cent. cockerels (stock and fattening), while the remainder (9 per cent.) comprised ducks, turkeys and geese. The variation between farms of different sizes in the number of birds per flock, value per bird, eggs per hen, and average price received per score of eggs was as follows:—

Size of farm (acres).	Percentage farms keeping poultry.	No. of birds per flock.	Average value per bird.	Average no. of eggs per hen.	Average price received per score.
20–50	94	152	4/9½	93	2/3¼
50–100	95	162	4/3	99	2/2½
100–150	90	243	4/4	101	2/3
150–300	90	273	5/0½	98	2/4
300–500	91	322	4/9½	95	2/3¾
Over 500	87	464	4/5¼	98	2/1¾

The egg yield averaged 97 per hen, but varied widely from farm to farm. One-quarter of the flocks yielded less than 75 eggs, and one-fifth yielded more than 125 eggs per bird. The price received for eggs sold averaged 2*s.* 3*d.* a score, or 1*s.* 4*d.* a dozen.

Eggs per hen.	Percentage of flocks.
Less than 50	5
50–74	19
75–99	29
100–124	28
125–149	14
150 and over	5
	100

6. HORSES

The types of livestock to which reference has been made in the previous sections of this chapter are "productive" in the sense that they are kept in the expectation of producing at a direct profit. Horses, however, fall into a different category for they are maintained, with certain rare exceptions, to perform the cultivations and transport demanded by productive enterprises. Over all farms in the district there was one work horse to 21½ acres of arable land, but this figure was influenced by the size of the farm, by the intensity of production, by the amount of mechanisation, and by the efficiency of the farm organisation. The effect of the first of these factors is illustrated below:

Size group (acres).	Work horses per farm.	Average value per horse. £	Arable acres per work horse.	Gross output per horse. £
20–50	1·93	19·3	11·9	184
50–100	3·02	21·3	16·2	182
100–150	4·23	22·6	18·7	209
150–300	5·54	23·6	23·4	233
300–500	8·20	24·7	29·4	281
Over 500	13·27	24·3	35·3	319

It appears from the above figures that large farms apply horse labour more efficiently than small farms, but in this respect it must be remembered that the larger farms enjoy greater scope for mechanisation. The following figures relate to farms of 300 acres and over, and illustrate the extent to which work performed by tractors influences the number of horses required.

No. of days tractor work performed per farm.	Percentage of farms.	Arable acres per horse on these farms.
0	34	27
1–119	43	31
120 and over	23	34

Over all farms the number of mares and geldings was approximately equal, but only about 4 per cent. of mares foaled during the year. The average value per working horse was £22¼, and the depreciation (calculated in the same way as that of dairy cows, see p. 32) was 30*s.* per horse per annum. The number of work horses lost by death was equivalent to 4½ per 100. During the year 9·5 per cent. were drafted out (including those lost by death), and 6·8 per cent. were drafted in. There was, therefore, a falling off of 2·7 per cent. in the number of horses kept. Whether this decrease is due to greater

mechanisation or diminished arable acreage cannot be ascertained from the data available. Of horses sold alive the majority realised knacker's prices. The trade done in sound horses was insignificant.

Approximately 85 per cent. of the total amount of horse stock carried were work horses, 7 per cent. comprised light horses (i.e. hacks, and milk or shepherds' ponies), 2 per cent. were unbroken 3-year-olds, 2 per cent. were 2-year-olds, 2 per cent. were yearlings, while the remaining 2 per cent. were foals born during the year.

CHAPTER IV.

CROPS

SOME reference to the place of crops in the economy of the six eastern counties has already been made in Chapter II. It was there shown that two-thirds of the farmed land is under the plough, and that of this arable area almost exactly one-half is devoted to cereals. But in spite of this large proportion of plough land, sales of 1931 crops averaged less than one-third of the gross farm income, and the bulk of the crops were marketed in the form of livestock or livestock products. The crop produce from only 28.5 per cent. of the farmed area was marketed direct; the produce from 68·5 per cent. was consumed by livestock or used for seed; while the remaining 3 per cent. was occupied by buildings, roads, or waste (see Table below).

Crop.	Percentage of farmed area.	Percentage disposal per farm of 1931 crops.*		Average yield per acre.	Approximate value per acre (£).
		Sold off farm.	Used on farm.		
Permanent pasture ..	24·5	—	100·0	—	1·5
Rough grazing ..	3·2	—	100·0	—	0·3
Meadows	7·3	15·9	84·1	22·6 c.	1·7
Mixed seeds	5·6				
Clovers	4·4				
Sainfoin	1·5	32·8	67·2	31·7 c.	3·0
Lucerne	0·7				
Trefoil	1·4				
Wheat	11·4	61·0	39·0	16·9 c.	6·0
Barley	13·5	66·5	33·5	14·0 c.	7·0
Oats	6·5	17·0	83·0	15·7 c.	6·0
Rye	0·3	20·8	79·2	8·8 c.	3·0
Mixed corn	0·1	0·9	99·1	15·2 c.	5·5
Beans	2·0	23·2	76·8	15·6 c.	5·0
Field peas	0·8	48·7	51·3	16·3 c.	5·5
Seed tares	0·1	70·4	29·6	18·0 b.	4·0
Other seed crops ..	0·3	79·9	20·1	—	6·0
Potatoes	0·8	94·1	5·9	5·0 t.	32·5
Sugar beet	2·1	99·4	0·6	7·5 t.	16·0
Mangolds	2·5	0·3	99·7	15·3 t.	14·0
Swedes and turnips ..	2·1	0·6	99·4	11·3 t.	8·0
Green crops	1·4	5·5	94·5	—	8·0
Bare fallow	3·7	—	—	—	—
Fruit and market garden crops..	0·8	80·4	19·6	—	20·0
Woods and waste ..	1·4	—	—	—	—
Buildings, roads, etc...	1·6	—	—	—	—
TOTAL ..	100·0	28·5	68·5	—	—

* These figures are computed by weighting the size group averages by the total number of farms in each group. They thus represent disposal on the "average farm," and not disposal of the total crop acreage.

It will be observed that one-quarter of the farmed land is permanent pasture, and that a further 21 per cent. is occupied by meadows for hay and temporary grass. On the "average farm" just over a quarter of the 1931 hay acreage was cashed direct. Cereals represent nearly a third of the total area, and three-fifths of these straw crops were cashed direct. Fallow crops, of which approximately one-third were cashed direct, account for 9 per cent. of the farmed area. Beans and field peas, little more than a quarter of which was cashed, represent less than 3 per cent. of the farmed area. From these figures it is clear that the proportion of the gross farm income represented by crops (see page 18), is in no way commensurate with either (*a*) the area covered, (*b*) the food value produced, or (*c*) the employment provided by the various crops. The total *value* of the crop produce (including pasture and straw) averages some £4¾ per acre of farmed land, and of this total approximately 46 per cent. was cashed, 50 per cent. was consumed by livestock, and 4 per cent. was used for seed.

The tabular statement on page 44 compares the distribution and sales of the 1931 crops on different sizes of farms. It will be noted that the larger farms sell a considerably greater proportion of cereals and hay than the smaller farms. For example, in the 20 to 50 acres size group less than 60 per cent. of the wheat grown was cashed direct, whereas in the over 500 acres size group nearly 85 per cent. of the crop was sold. In no size group, however, do direct crop sales represent more than one-third of the total farmed area.

Sales of 1931 crops represent on the average 29 per cent. of the gross farm income. On the larger farms crop receipts form a considerably greater proportion of the gross income than on the smaller farms. The following figures show the percentage of farms in the different size groups selling varying amounts of crops.

Size group (acres).	Percentage of farms selling crops to the value of:—						
	£0.	£1–100.	£101–300.	£301–500.	£501–1000.	£1001–1500.	Over £1500.
20–50	22	54	18	2	3	1	—
50–100	8	33	48	9	2	—	—
100–150	8	14	50	16	11	—	1
150–300	7	7	28	23	30	3	2
300–500	3	5	9	20	37	17	9
Over 500	3	—	3	11	13	19	51

Nearly 12 per cent. of farms sold no 1931 crops, while 5 per cent. sold over £1000 worth. In considering these figures, it must be borne in mind that during a period of low crop prices the farmer tends to feed rather than to cash

DISTRIBUTION AND SALES OF 1931 CROPS

Size Group	20–50 Acres		50–100 Acres		100–150 Acres		150–300 Acres		300–500 Acres		Over 500 Acres	
Crop:—	Crop area as % of farm area	Amount sold as % of crop area	Crop area as % of farm area	Amount sold as % of crop area	Crop area as % of farm area	Amount sold as % of crop area	Crop area as % of farm area	Amount sold as % of crop area	Crop area as % of farm area	Amount sold as % of crop area	Crop area as % of farm area	Amount sold as % of crop area
Permanent pasture	22·2	—	22·0	—	23·7	—	26·5	—	23·6	—	26·1	—
Meadows	8·8	10·4	7·8	16·0	8·8	13·4	7·9	21·2	6·2	26·9	4·7	21·3
Mixed seeds	5·5	5·5	6·5	15·2	5·7	22·7	6·0	28·9	4·8	30·3	5·2	27·4
Clovers	4·4	35·4	4·3	42·8	4·9	51·2	4·4	60·1	4·7	71·7	3·6	66·4
Sainfoin	0·7	43·0	1·1	50·3	1·1	46·4	0·8	47·5	2·2	54·8	3·1	50·7
Lucerne	0·6	2·4	0·4	23·6	0·7	38·3	0·7	20·8	0·5	9·6	1·2	7·9
Trefoil	0·9	35·5	0·8	31·3	1·1	49·4	1·4	40·2	1·9	52·6	1·9	41·5
Wheat	11·6	58·3	11·9	61·3	11·0	57·5	11·4	60·0	11·7	70·2	10·3	84·7
Barley	14·5	64·2	15·7	65·2	13·6	69·0	12·3	70·2	12·8	69·0	14·4	61·8
Oats	6·3	22·2	6·5	16·6	6·6	12·2	6·8	14·5	6·7	18·4	5·5	9·1
Rye	0·1	—	0·2	17·8	0·2	48·4	0·2	29·2	0·4	23·1	0·4	44·2
Mixed corn	0·1	—	0·1	—	0·2	—	0·1	3·4	0·2	2·1	—	—
Beans	3·0	29·1	2·3	21·8	2·0	25·4	1·8	16·4	2·0	17·4	1·4	23·4
Field peas	0·8	54·8	1·0	45·6	0·7	50·0	0·8	44·0	0·8	49·6	0·6	37·9
Seed tares	0·2	73·9	0·1	57·4	0·1	60·0	0·1	83·9	0·2	77·3	—	96·7
Other seed crops	0·2	96·6	0·3	50·7	0·1	78·3	0·4	93·2	0·2	87·4	0·3	66·0
Potatoes	1·9	90·1	0·6	84·0	1·0	92·4	0·8	90·0	0·6	91·6	0·4	92·8
Sugar beet	2·8	98·4	2·8	99·8	2·4	99·6	2·1	100·0	1·4	100·0	2·2	100·0
Mangolds	5·0	0·3	3·8	—	3·0	0·6	2·3	0·3	1·6	0·1	1·4	0·5
Swedes and turnips	2·3	0·2	2·2	0·5	2·1	1·2	2·1	0·4	1·8	2·8	2·5	—
Green crops	0·7	1·0	0·8	4·4	0·8	9·9	1·2	11·9	1·7	—	2·6	4·4
Bare fallow	2·2	—	3·9	—	4·1	—	3·3	—	4·4	—	3·9	—
Fruit and market garden crops	1·4	82·4	0·6	73·9	1·5	89·6	0·8	84·3	0·7	69·4	0·4	69·8
Rough grazing	1·4	—	1·6	—	1·9	—	2·9	—	5·1	—	4·8	—
Woods and waste	0·1	—	0·8	—	1·0	—	1·3	—	2·4	—	2·0	—
Buildings, roads, etc.	2·3	—	1·9	—	1·7	—	1·6	—	1·4	—	1·1	—
TOTALS	100·0	27·9	100·0	28·6	100·0	28·7	100·0	28·4	100·0	30·7	100·0	29·4

his crops. Further, the large decrease in the wheat and sugar beet acreage in 1931, as compared with 1930, has largely reduced the volume of directly cashable crop produce.

1. WHEAT

During the past year, political interest in agriculture has veered from sugar beet to wheat. The cost of growing wheat averages £8 an acre with a range of from £4 to £12. So far as employment is concerned, an acre of wheat requires approximately 50 hours of manual labour with ordinary methods of cultivation and harvesting. Four times as much manual labour is required* for either (1) one acre of potatoes or sugar beet, (2) one cow, (3) ten pigs, or (4) eighty poultry. With fully mechanised methods the cost of producing an acre of wheat, and the employment provided, will be very much less than the average figures shown above.

The area covered by wheat in 1931 was the smallest on record, and represented just over 11 per cent. of the total farmed land, or some 18½ per cent. of the arable acreage in the six eastern counties. In certain districts, particularly on the clay soils, wheat covered a much larger proportion of the farmed land than in others, and Table III in the Appendix shows a variation of from 3 per cent. on the Norfolk breck to nearly 19 per cent. on the north Essex boulder clays. Two-thirds of the total wheat acreage of the Province was grown on farms of more than 150 acres in size, while two-fifths of the wheat marketed came from farms of more than 300 acres in size. Farms of less than 100 acres (representing more than half of all holdings of 20 acres or more) were responsible for just over one-fifth of the total wheat acreage, and one-fifth of the total wheat marketed.

	Six eastern counties		
Size group (acres).	% of total holdings over 20 acres.	% of total 1931 wheat acreage.	% of total wheat sold.
20–50	33	8	7
50–100	21	14	13
100–150	14	13	11
150–300	21	31	29
Over 300	11	34	40
Total ..	100	100	100

* *The Seasonal Distribution of Farm Labour Requirements.* Cambridge University Department of Agriculture, Farm Economics Branch Report, No. 14.

The yield of the 1931 crop, at less than 17 cwt. per acre, was approximately 8 per cent. below the 10-year average. On the clays the yield was 1 cwt. less than the average for all soils, while on the loams the yield was 1 cwt. above the over-all average. There was no significant difference in the yields on the different sizes of farm. Forty-seven per cent. of farms growing wheat showed a yield of less than 4 qrs., and only 14 per cent. showed a yield of over 5 qrs. per acre.

Yield per acre (qrs.)	Percentage of farms growing wheat.
Less than 2	2
2–2·9	11
3–3·9	34
4–4·9	39
5–5·9	12
6 and over	2
Total	100

Two-thirds of the 1931 crop was cashed direct and the average price realised was 27*s.* per qr. Wheat sold is not wholly purchased for milling, a certain proportion being bought by other farmers for feeding and seed. If allowance is made for these farm-to-farm transactions, and for the wheat purchased by occupiers of less than 20 acres, and by "back-yard" poultry keepers, it would appear that not more than 60 per cent. (probably about 55 per cent.) of the 1931 crop was milled. In this connection it must be borne in mind that the very low price obtainable encouraged farmers to feed rather than to sell their wheat. Nearly 40 per cent. of all farms over 20 acres in size sold no wheat, and only 3 per cent. sold more than £300 worth.

Size group (acres).	Percentage of farms selling wheat to the value of:—				
	£0.	£1–100.	£101–300.	£301–500.	Over £500.
20–50	52	48	—	—	—
50–100	36	61	3	—	—
100–150	41	46	12	1	—
150–300	34	35	29	2	—
Over 300	15	23	37	17	8

Thirty-five per cent. of the 1931 crop did not leave the farm on which it was grown, 29 per cent. being consumed by livestock, and 6 per cent. being used as seed for the ensuing year's crop.

The average rate of seeding, the proportion of the 1931 crop grown from purchased seed, and the cost of purchased seed is shown on page 64. A very large number of varieties were in use, the most common being Square Head Master, Little Joss, and Yeoman.

Variety.	Percentage of farms growing this variety:— Clay.	Loam.	Gravel.
Square Head Master	21	25	26
Little Joss	13	14	43
Yeoman I and II	16	11	5
Standard Red	4	8	12
Renown	9	8	6
Wilhelmina	9	12	1
Victor	15	5	1
Rivett	8	—	1
Swedish Iron	—	3	1
Bacton's Champion	—	4	—
Browick	—	2	1
Twenty-five other varieties ..	5	8	3
Total	100	100	100

Approximately two-fifths of the 1931 wheat area received a dressing of farm-yard manure at an average rate of 11 loads per acre. Only 22 per cent. of the crop area received a quick-acting nitrogenous fertiliser, and where this was applied the average dressing was just over 1 cwt. per acre.

2. BARLEY

In the eastern counties the area under barley is greater than the area under wheat. Norfolk and Suffolk are the principal barley counties, contributing nearly three-quarters of the total barley acreage of the six counties.

The acreage under barley in 1931 represented 13½ per cent. of the total farmed area, or just under 22 per cent. of the arable area. Great variations in the proportion of barley grown occur between districts, the range being from 1 per cent. of the farmed land on the south Essex london clays to 21 per cent. on the central Norfolk light loam, and as much as 30 per cent. of the farmed land on the south Cambridgeshire gravels. In many respects the southern parts of Cambridgeshire have in recent years eclipsed Norfolk as

a barley growing area. The proportion of barley on the different sizes of farms does not vary significantly. Two-thirds of the total barley acreage of the Province, and the same proportion of the barley marketed, was grown on farms of more than 150 acres in size, while farms of over 300 acres (representing 11 per cent. of the holdings) were responsible for one-third of the total barley sold.

	Six eastern counties		
Size group (acres).	Percentage of total holdings over 20 acres.	Percentage of total 1931 barley acreage.	Percentage of total barley sold.
20–50	33	8	8
50–100	21	15	15
100–150	14	14	14
150–300	21	28	29
Over 300	11	35	34
Total	100	100	100

The yield of the 1931 barley crop was on the whole lower than the 10-year average, but varied greatly from one district to another. The south Cambridgeshire gravels returned the highest yield at 17 cwt. per acre; the central Norfolk light loams and the south-east Suffolk gravels yielded 15 cwt.; the north Essex boulder clays and the central Suffolk heavy loams gave 13 cwt.; while only 11 cwt. per acre were harvested on the north-east Suffolk gravels and the Norfolk breck. There was no significant difference in the yield on different sizes of farm. On nearly half the farms on which barley was grown the yield was less than 4 qrs., and on only 10 per cent. was the yield over 5 qrs. per acre.

Yield per acre (qrs.).	Percentage of farms growing barley.
Less than 2	5
2–2·9	19
3–3·9	34
4–4·9	32
5–5·9	8
6 and over	2
Total	100

Two-thirds of the 1931 crop was cashed direct, although in the central Norfolk district and on the south Cambridgeshire gravels more than three-quarters of the crop was sold. If allowance is made for the barley purchased

by other farmers for seed and for feeding, it would appear that not more than 55 per cent. of the 1931 crop was available for brewing. The difference in price between feeding and malting samples of barley may be as much as 100 per cent. Good quality malting barleys are associated with certain districts, particularly the lighter soils in the north of Norfolk and the south Cambridgeshire gravels. The average price realised by the south Cambridgeshire barleys was 37*s.* 4*d.* per qr., as compared with 34*s.* 4*d.* in the central Norfolk district, and 29*s.* 5*d.* on the Huntingdon and west Cambridge clays.

Tables II and III in the Appendix show that in each size group, and in four out of the ten district groups, receipts for barley sales exceeded (particularly in the south Cambridgeshire and central Norfolk districts) the receipts for wheat. Thirty-six per cent. of all farms over 20 acres in size sold no barley and six per cent. sold more than £300 worth.

Size group (acres).	Percentage of farms selling barley to the value of:—				
	£0.	£1–100.	£101–300.	£301–500.	Over £500.
20–50	45	53	2	—	—
50–100	32	53	14	1	—
100–150	34	35	29	2	—
150–300	32	27	30	9	2
Over 300	26	14	26	16	18

Thirty-three per cent. of the 1931 crop did not leave the farm on which it was grown, 26 per cent. being consumed by livestock, and 7 per cent. being used as seed for the ensuing year's crop.

The average rate of seeding, the proportion of the 1931 crop grown from purchased seed, and the cost of the purchased seed is shown on page 64. The range in varieties grown is much smaller than is the case with wheat, Spratt Archer and Plumage Archer being the most popular.

Variety.	Percentage of farms growing this variety:—		
	Clay.	Loam.	Gravel.
Spratt Archer ..	26	66	57
Plumage Archer ..	48	21	21
Archer	20	11	18
Chevallier	1	—	3
Ten other varieties ..	5	2	1
Total ..	100	100	100

Less than one-tenth of the area under barley was dunged, and, apart from compound mixtures, 15 per cent. received a dressing of quick-acting nitrogenous fertiliser at an average rate of just over 1 cwt. per acre.

3. OATS

In the eastern counties oats are not considered a cash crop. The area under oats in 1931 was approximately half that under barley, and represented 6½ per cent. of the farmed land, or 10½ per cent. of the arable acreage. Less than one-fifth of the oat crop was cashed direct (the average price realised being 19*s.* per qr.); three-quarters was fed to livestock on the farm on which it was grown, and 7 per cent. was retained as seed for the following year. Four-fifths of all farms over 20 acres in size sold no oats, and less than 2 per cent. of farms sold more than £100 worth.

The yield ranged from 14 cwt. per acre on the clays to 17 cwt. on the loam soils. The Norfolk breck district showed the lowest yield at 13 cwt. per acre. On 70 per cent. of the farms growing oats a yield of 15 cwt. or more was secured. Dung was applied to 13 per cent. of the crop area, and, apart from compound mixtures, only 19 per cent. received a dressing of quick-acting nitrogenous fertiliser at an average rate of just over 1 cwt. per acre.

Yield per acre (qrs.).	Percentage of farms growing oats.
Less than 2	2
2–2·9	4
3–3·9	8
4–4·9	16
5–5·9	33
6 and over	37
Total	100

The average rate of seeding was 4 bushels per acre, and one-third of the 1931 crop was grown from purchased seed.

4. SUGAR BEET

The sugar beet crop was unquestionably of great assistance to farmers on all but the clay soils during the first two periods of the subsidy. The commencement in 1931 of the third period of the subsidy, with the resultant reduction in the price of beet, caused a large drop in acreage, the official

estimate for the year being 33 per cent. less than the 1930 acreage. It must be borne in mind, however, that the acreage under beet in 1930 was the highest on record, and that the 1931 acreage, in spite of the reduction, is higher than that of any year previous to 1930.

One of the principal advantages of sugar beet is that it provides a *cash crop* for the root break. In certain districts the crop is of special importance, particularly in the Fens (which are not included in the present investigation), in Norfolk, and on the lighter soils of Suffolk and Cambridgeshire. The 1931 season was unfavourable to beet production, and the yield at 7½ tons per acre was one ton less than that obtained in 1930. One-third of the growers obtained a yield of less than 7 tons, and only one-quarter had a yield of over 9 tons per acre. Yields were lowest on the Norfolk breck and the north-east Suffolk gravels. More than half the total sugar beet acreage was grown on farms over 150 acres in size, while the yields appeared to be significantly higher on the large farms than on the small.

	Six eastern counties		
Size group (acres).	Percentage of total holdings over 20 acres.	Percentage of total 1931 beet acreage.	Average yield per acre (tons).
20–50	33	10	6·4
50–100	21	17	7·0
100–150	14	15	7·5
150–300	21	30	7·8
Over 300	11	28	8·0

The price received by growers averaged 43s. per ton. At this price, and with the low yields obtained, the crop would result in a cash deficit (i.e. not allowing for "tops" and residual values) of some £3 per acre, a loss which is probably considerably less than that left by mangolds. Table III in the Appendix shows the relative *cash* importance of sugar beet in the different localities, while the following figures illustrate the proportion of farmers in the different size groups selling varying amounts:—

	Percentage of farms selling beet to the value of:—				
Size group (acres)	£0.	£1–100.	£101–300.	£301–500.	Over £500.
20–50	80	18	1	1	—
50–100	68	21	10	1	—
100–150	68	15	15	1	1
150–300	66	7	20	4	3
300–500	63	8	21	5	3
Over 500	54	8	5	14	19

Information on rate of seeding and cost of seed is given on page 64. Approximately half of the crop received a dressing of dung at the rate of 12 loads per acre. Fourteen per cent. of the crop received no fertilisers, while 33 per cent. was dressed with more than £2 worth of fertilisers per acre. On the average the following amounts of fertilisers were applied per acre:— 2½ cwt. proprietory mixtures, ¾ cwt. phosphatic, ⅔ cwt. nitrogenous, and ½ cwt. potassic fertiliser.

Readers who desire fuller information on the economics of beet production in the Province should refer to *Sugar Beet in the Eastern Counties*, Report No. 16 of the present series.

5. POTATOES

The Holland Division of Lincolnshire and the Isle of Ely are the two principal potato growing areas in England. Neither of these districts, nor the important potato growing county of Bedfordshire, is included in the present survey, and the data given in this section must, therefore, be used with caution. In the six counties covered by this investigation potatoes occupy a comparatively unimportant place, their production being confined principally to certain small localities which possess either special soil or special marketing facilities. Amongst these must be mentioned the south Hertfordshire gravels, the lighter soils in the south and north-east of Essex, and the alluvials of Huntingdonshire, north Cambridgeshire, and west Norfolk. But that the crop is little more than a side-line apart from these localities is illustrated by the following figures showing that, of farms over 20 acres in size in the six counties as a whole, nearly three-quarters grew no potatoes, and only 4 per cent. had more than 8 acres.

Area of potatoes grown (acres).	Percentage of farms with this acreage.
None.	72
0·1–1	9
1·1–2	8
2·1–4	4
4·1–8	3
8·1–16	3
Over 16	1
..	—
Total	100

The yield at 5 tons per acre was approximately one ton below the 10-year average. One-quarter of the growers achieved a yield of less than 4 tons, and scarcely one-fifth had a yield of more than 7 tons. King Edward was by far the most common variety grown, Majestic, Arran Chief, and Eclipse coming next in popularity.

The average price realised by potatoes sold before Christmas 1931 was £6½ per ton. One-fifth of all farms sold at least some potatoes, and nearly one-tenth sold more than £100 worth. Seed was planted at an average rate of 14 cwt. per acre (see page 64), and two-thirds of the crop was grown from purchased seed. Three-quarters of the acreage under potatoes were dunged at a rate of around 16 loads per acre, but even on farms growing more than one acre, no less than 30 per cent. of the crop received no fertilisers, while 45 per cent. was dressed with more than £2 worth of fertilisers per acre. On the average the following amounts of fertilisers were applied per acre: 3½ cwt. proprietory mixtures, ½ cwt. phosphatic, ⅓ cwt. nitrogenous, and ¼ cwt. potassic fertiliser.

6. HAY

The area cut for hay represents just over one-fifth of the total farmed land, and the crop must, therefore, be considered an important one in the Province. Of the area cut for hay, one-third is meadow land and two-thirds is temporary seeds of one sort or another. The season, like that of 1930, yielded an abundant hay crop, although the quality was poor and second cuts were largely left unharvested on account of bad weather.

The yield of meadow hay, at 22½ cwt. per acre, was some 25 per cent. above the 10-year average of the district. Of the meadow hay harvested one-sixth was sold off the farm, the average price realised being 31*s.* 6*d.* per ton.

Three-quarters of the seeds hay was comprised of mixtures (41 per cent.) and clean clovers (32 per cent.); the remaining quarter was made up of sainfoin (11 per cent.), trefoil (11 per cent.), and lucerne (5 per cent.). The yield of first cuts, at 31½ cwt. per acre, was approximately 25 per cent. above the 10-year average of the district. One-third of the seeds hay harvested was sold off the farm, mixtures averaging 39*s.* per ton, clovers 37*s.*, sainfoin 36*s.*, lucerne 35*s.*, and trefoil 32*s.*

Nearly a third of the clovers and an eighth of the sainfoin was cut a second time. In both cases approximately nine-tenths of the second cut was intended for seed, and one-tenth for hay. The bad weather associated with the second cuts rendered the bulk of the seed crop worthless, and the hay of very poor quality.

7. PERMANENT GRASS

Permanent grass, including meadows for hay, covers one-third of the farmed area in the six eastern counties. This proportion varies very greatly between one district and another, and Table III in the Appendix shows permanent grass ranging from as little as 14 per cent. of the farmed land on the south Cambridgeshire gravels, to as much as 77 per cent. on the south Essex london clays. The low rainfall of the Province, and particularly the high summer evaporation, is unfavourable to the establishment of good permanent grass, while lack of drainage (both natural and artificial), and the nature of the soil, form additional handicaps in certain districts.

Conflicting opinions are common in regard to capitalisation, productivity, etc., on grass as compared with arable farms. It is not always appreciated, however, that grass farming is as amenable to intensive and extensive methods of production as arable farming, and that in effecting comparisons it is necessary to compare like degress of intensity in each case. With regard to the productivity of grass and arable land alternative bases of comparison are (1) food values, and (2) money values; the former being important nationally only in time of war, and the latter being the principal consideration to the individual producer at all times. These points should be borne in mind when studying the figures given in the ensuing paragraphs.

Approximately one-fifth of holdings over 20 acres in the Province have at least 60 per cent. of their total area under permanent grass; just over a half have between 20–59 per cent.; and the remaining quarter have less than 20 per cent. permanent grass. The most common proportion of permanent

Size group (acres).	Percentage of farms on which permanent grass amounted to the following proportions of the total farmed land:—					
	0–19%.	20–39%.	40–59%.	60–79%.	80–99%.	100%.
20–50	33	40	7	4	5	11
50–100	24	50	11	6	3	6
100–150	28	42	11	7	8	4
150–300	17	41	24	8	7	3
300–500	16	48	20	11	5	—
Over 500	30	27	24	16	3	—

grass land is between 20–39 per cent. of the farmed land, as much as two-fifths of the holdings falling into this group. The following figures compare certain economic factors in the organisation of farms grouped by the proportion of permanent grass land.

Permanent grass (%).	Average size of farm (acres).	Per 100 acres:— Farm capital (£).	Gross output (£).	Manual workers (No.).	Output per £100 labour (£).
0–19	151	943	601	3·4	175
20–39	160	961	577	3·3	177
40–59	223	860	591	2·6	216
60–79	231	792	523	2·2	233
80–99	193	800	656	2·1	280
100	83	957	996	3·1	298

Great caution must be exercised in interpreting these figures, for size of farm (see page 21) is more important than the percentage of arable in determining density of employment, capital requirements, and output per 100 acres, and the average size of farm in the different groups varies considerably. But even though the group having 100 per cent. permanent grass is omitted on account of the much smaller size of its farms, it may be inferred, that, *other things remaining equal,* employment varies directly with the proportion of arable land; that there is a tendency for capital requirements to vary in a similar way, though to a lesser extent; that the *value* of the output (*at* 1931 *price levels*) was not significantly different in the various groups; and that the output per £100 labour varies inversely with the proportion of arable.

The importance of livestock as a source of revenue varies directly with the proportion of grass, and this fact is largely responsible for the quicker rate of capital turnover secured on those farms with a small proportion of

Permanent grass (%).	Average size of farm (acres).	Per 100 acres:— Capital invested in livestock (£).	Cows (No.).	Sales of livestock and livestock produce (£).	Capital turnover (%).
0–19	151	333	2·0	383	64
20–39	160	368	4·3	428	60
40–59	223	373	6·0	451	69
60–79	231	416	6·5	432	66
80–99	193	517	10·1	665	82
100	83	690	14·6	1090	104

arable land. The very low prices realised by farm crops, particularly cereals, during the year under review have, of course, depressed abnormally the cash

receipts from crops, but it will be evident that expenditure on feeding stuffs is an item of major importance even on farms having a high proportion of arable land. It appears that the grass farms, in spite of their heavy expenditure on purchased feeding stuffs, secured a higher livestock output per £100 worth of fodder than the arable farms, and this is at least partly due to the greater density of dairy stock carried.

Permanent grass	Average size of farm	Per 100 acres:—			Livestock output per £100 worth foods
		Sales of crops including cereals	Sales of cereal crops only	Purchases of feeding stuffs	
(%).	(acres).	(£).	(£).	(£).	(£).
0–19	151	315	173	95	166
20–39	160	222	116	101	178
40–59	223	175	68	101	205
60–79	231	112	32	99	222
80–99	193	37	5	166	263
100	83	24	—	323	232

To sum up, it may be said that current price and cost levels favour grass land, primarily because of the higher output per £100 worth of labour, and the quicker rate of capital turnover which it permits.

CHAPTER V.

COSTS

THE distribution of the items comprising the total farm charges has been described in general terms in Chapter III, and is detailed by size of farm and by farming locality in Tables II and III in the Appendix. Labour represents nearly 36 per cent. of the gross charges, and is the largest individual item; purchased foodstuffs are second in importance at 17 per cent.; rent and purchases of livestock are each equal to approximately 13½ per cent.; seeds and fertilisers each represent 2¾ per cent.; while the remainder (14½ per cent.) is made up of various miscellaneous expenses detailed in Table IV of the Appendix.

1. LABOUR*

The average labour bill per farm in the various size groups is shown in Table II in the Appendix. The amounts there recorded cover three classes of workers, viz.: (1) regular paid employees, (2) family labour other than that of the occupier (e.g. wife, brother, etc.), and (3) paid casual employees. The remuneration of the regular paid employees is comprised mainly (83 per cent.) of fixed weekly cash earnings, and partly (17 per cent.) of certain cash extras and payments in kind. The charge for family work has been valued at the equivalent cost of hired labour. Between one size group and another there are wide variations in the proportion of total labour represented by the three classes of workers. On the smaller farms, for example, family labour represents a much larger proportion of the total than on the larger farms.

	Percentage of total labour bill:—					
	Regular paid employees.		Family labour.†			
Size group. (acres).	Weekly cash.	Extras.	Wife.	Others.	Casual workers.	Total labour bill.
20–50	49	13	11	14	13	100
50–100	59	15	6	10	10	100
100–150	67	12	3	9	9	100
150–300	73	14	2	4	7	100
300–500	77	14	1	3	5	100
Over 500	80	13	—	2	5	100

* The relationship between output per unit of labour and profitableness is discussed on page 73.
† Not including that of the occupier.

Of the regular paid employees (not including salaried managers) 42 per cent. are "high-pay" workers earning an average *cash* wage (i.e. exclusive of extras, insurance contributions, etc.) of 35*s.* 6*d.* per week; 45 per cent. are ordinary labourers with an average *cash* wage of 28*s.* 6*d.* per week; while 13 per cent. are "low-pay" workers (e.g. women, boys, old-age pensioners, etc.) with an average *cash* wage of 17*s.* 6*d.* per week. Additions to these cash wages consist principally of overtime payments, bonuses (principally harvest bonus), insurance contributions, board and lodging, cottages and milk. The value of these extras averages 6*s.* per week (£15½ per annum) per regular paid employee. The average weekly cash wage for all regular paid employees is 30*s.* per week, which, with extras, insurance and perquisites at 6*s.* per week, gives a total cost to the farmer of 36*s.* per week per worker.

Overtime and harvest bonuses (both paid in cash) collectively account for two-fifths of the additions to the weekly cash wages of the regular paid employees; insurance (mainly National Health Insurance) represents nearly one-third; board and lodgings, one-seventh; cottages, one-tenth; while milk, potatoes and coal make up the insignificant remainder. It should be noted that as the regular weekly cash earnings have been computed *ex.* the employees contribution to Health Insurance, the *total* cost of insurance is included in these additions. Tied cottages are more common on the large than on the small farms, but board and lodging in the farmer's own house represents a much larger proportion of the total extras on the small than on the large farms.

The number of "man weeks" casual employment provided by the different sizes of farms, and the type of work on which this labour was employed is shown in the following figures:—

Size group (acres).	"Man weeks" casual work per farm.	"Man weeks" casual work on:—					
		Threshing.	Root harvest.	Root singling.	Cereal harvest.	Hay.	Other work.
20–50	9	2¼	1½	1½	1½	2	¼
50–100	14	4½	3	2	2⅓	2	⅙
100–150	19	5½	4	2½	2½	4	½
150–300	24	6½	6	4	3½	3	1
300–500	25	8¼	5¼	4¼	4½	2	¾
Over 500	50	5	25	14	5	1	—

In calculating the Investment Income and Profit Surplus (see page 14), an allowance has been made for the manual and managerial labour of the occupier himself. This allowance has been computed at the rate of £2 per week for manual work, and £4 per week for managerial activities. Thus a

farmer who works half of his time along with his employees, and the other half in organising his business would be charged at £156 per annum. On the small farms the occupiers are mainly engaged in manual work, but, as the size increases, managerial functions occupy an ever greater share of the farmer's time. Nearly one-quarter of the farms over 500 acres in size have a salaried manager, and this accounts for the reduction in the weeks worked by, and allowance made for the occupiers of the largest size group.

Size group (acres)	Occupier's own labour per farm:— Weeks spent on farm work:— Manual work.	Managerial.	Total allowance. (£)
20–50	43	5	107
50–100	41	8	116
100–150	38	11	123
150–300	29	20	138
300–500	19	30	158
Over 500	7	34	148

The density of employment varies considerably between the different farming districts, and the relative data are given in Table III in the Appendix.

2. FEEDING STUFFS

Purchased foodstuffs form the second largest item in the cost budget, averaging 17 per cent. of the gross charges. The expenditure on foodstuffs per farm for the different size groups is shown in Table II in the Appendix, but in connection with these figures it must be remembered that they relate only to *purchased* foods which are mainly supplementary to the large quantities of home grown pasture and crops consumed by livestock.

The items comprising the total outlay on purchased foodstuffs are shown in the following figures. In addition to providing approximate "weights" for calculating a local cost index, these figures illustrate the wide range in choice open to the farmer. It will be observed that for all sizes of farms, middlings is by far the largest individual item, composing just over one-quarter of the total expenditure on foodstuffs. For this reason alterations in the price of middlings are of special interest to the farmer. Proprietary foods (dairy nuts, "fattening" mixtures, etc.) are next in importance, while cereals, of which barley is the most and wheat the least important, form the third largest item. Poultry "corn and meals" comprise an indistinguishable miscellany of which much would no doubt be more correctly analysed under the heading "cereals" (e.g. Sussex ground oats, etc.).

	Percentage of total expenditure on purchased foods in the different size groups.							
	20–50 acres.	50–100 acres.	100–150 acres.	150–300 acres.	300–500 acres.	Over 500 acres.	All sizes.	Average cost per ton (£).
Middlings	28·3	27·1	26·0	21·8	25·3	18·9	25·9	6·29
Proprietary mixtures..	13·7	18·8	14·5	19·3	11·7	15·9	16·1	8·54
Cereals	10·2	8·8	12·8	10·7	6·6	6·9	10·0	6·66
Poultry "corn & meal"	15·4	6·1	4·9	4·8	5·4	8·2	8·4	10·61
Bran	8·0	9·2	8·1	7·0	6·8	4·2	8·0	6·19
Linseed cake	5·0	5·7	6·3	9·9	14·9	13·5	7·3	9·73
Maize	7·3	8·3	8·1	4·1	4·9	2·5	6·8	5·21
Cotton cake	3·2	6·7	6·9	7·5	10·4	9·8	6·2	5·98
Protos	1·8	2·7	3·4	5·2	3·9	6·0	3·2	4·52
Straw and chaff ..	2·6	1·1	1·1	0·4	0·5	—	1·3	1·86
Brewers' grains ..	0·1	—	1·4	2·8	2·7	1·3	1·0	4·68
Fish meal	0·9	0·6	0·8	0·7	2·1	1·7	0·9	18·41
Peas and beans ..	0·6	0·9	0·2	1·5	1·5	1·9	0·9	7·10
Ground nut cake ..	—	0·7	1·1	1·2	1·3	3·7	0·7	7·88
Hay	0·8	1·3	0·4	0·4	0·3	—	0·7	2·37
Rice meal	0·1	0·2	0·3	0·5	1·0	2·1	0·4	5·47
Cocoanut cake ..	0·1	0·1	1·1	0·7	0·4	—	0·4	7·11
Miscellaneous (10 varieties)	1·9	1·7	2·6	1·5	0·3	3·4	1·8	—
Total expenditure ..	100·0	100·0	100·0	100·0	100·0	100·0	100·0	—

Variations in the relative importance of purchased foodstuffs in the different farming districts are shown in Table III in the Appendix. On the south Essex london clays, where the proportion of grass land is very high, and where dairying is the principal enterprise, expenditure on foodstuffs accounts for nearly one-quarter of the gross charges, and amounts to over 34*s.* per acre. At the other end of the scale come the Huntingdon and west Cambridge clays where expenditure on foodstuffs amounts to less than 12*s.* per acre, or 12 per cent. of the gross charges.

As already emphasised, purchased foods are mainly supplementary to pasture and other home-grown fodder crops. Certain farm crops (e.g. mangolds) are grown primarily for feeding to livestock, while other crops (e.g. barley) are produced either to cash direct, or to feed to livestock, whichever may be the most advantageous method of disposal. It has already been shown (see page 43) that of the total *value* of the 1931 crop products no less

than 50 per cent. was marketed in the form of livestock and livestock products. Over the whole range of farms livestock have thus consumed home-produced fodder to the value of approximately 49*s.* per acre of farmed land, to which must be added expenditure on purchased feeding stuffs, which averages 24*s.* per acre, i.e. expenditure on purchased feeding stuffs is equivalent to only about one-third of the total value of all foods fed to livestock.

3. LIVESTOCK

Purchases of livestock for feeding, breeding, or replacements form the third largest item in the farmer's cost schedule. The purchase of horned stock for rearing or fattening is the largest individual component under this heading; replacements of dairy cattle come next in importance; sheep come third; pigs fourth; while expenditure on horse stock is only slightly larger than expenditure on poultry stock. The outlay on purchases of livestock per farm for the various size groups is shown in Table II in the Appendix, and the following figures illustrate how these sums are comprised:—

Size group (acres).	Percentage of total purchases of livestock represented by:—					
	Store cattle.	Dairy cattle.	Sheep.	Pigs.	Horses.	Poultry.
20–50	15	33	10	32	7	3
50–100	21	34	12	18	6	9
100–150	35	29	14	11	4	7
150–300	43	18	25	9	4	1
Over 300	40	15	33	7	3	2

It will be noted that the purchase of store cattle and sheep form a much larger proportion on the bigger farms than on the smaller farms, while the positions are reversed in the case of dairy cattle and pigs.

In the locality groups (Table III, Appendix) it appears that purchases of livestock bulk largest in the central Norfolk district where feeding cattle are of major importance. The smallest purchases of livestock are found on the north Essex boulder clay, and the Huntingdon and west Cambridge clays.

4. RENT

The rental value of all soils and sizes of farm averages 19*s.* 6*d.* per acre, representing 13½ per cent. of the gross charges. The rent charge per acre on the small farms is higher than that on the large farms. This is due mainly

to the fact that on the small farms, capital invested in buildings and improvements is, relative to the total value of the property, greater than that on the large farms, while the cost of estate administration is also higher on the small farms.

Size group. (acres).	Average rent per acre. s. d.	Rent as % of gross charges. %
20–50	30 0	14·0
50–100	24 10	14·3
100–150	21 5	13·6
150–300	18 6	13·4
300–500	16 2	13·8
Over 500	13 3	11·9

As might be expected there are considerable variations in the rental value of land in the different agricultural districts of the Province (see Table III, Appendix). Farms on the Norfolk breck show the lowest rental value at 9*s*. per acre, while the other extreme is the south Hertfordshire gravel at 24*s*. 6*d*. per acre.

5. FERTILISERS

The average amounts spent on fertilisers in different size groups are shown in Table II in the Appendix. For all soils and sizes of farms the expenditure averages the very low figure of 4*s*. per acre of crops and grass, while nearly 30 per cent. of farmers bought no fertiliser at all.

	Expenditure on fertilisers.		% of farms buying fertilisers to the value of:—						
Size group. (acres).	Per 100 acres arable.	Per acre farmed land.	£0	£1–8	£8–16	£16–32	£32–64	£64–128	Over £128
	£	s. d.	%	%	%	%	%	%	%
20–50	33	4 2	45	33	11	7	3	1	—
50–100	29	3 9	28	21	26	17	6	2	—
100–150	30	3 10	27	14	16	24	14	3	2
150–300	33	3 10	19	6	12	20	24	14	5
300–500	31	3 10	19	4	5	10	25	20	17
Over 500	40	4 11	5	5	—	6	8	27	49

The farmer's reliance on ready mixed manures is very considerable, for proprietary mixtures of one type or another account for well over one-third of the total expenditure on purchased fertilisers. Sulphate of ammonia is

second, and superphosphate third in importance. The various items comprising the total outlay on fertilisers are shown in the following figures, which provide a basis for calculating a local cost index.

	Percentage of total expenditure on fertilisers in the different size groups.							Average cost per ton (£.)
	20–50 acres.	50–100 acres.	100–150 acres.	150–300 acres.	300–500 acres.	Over 500 acres.	All sizes.	
Proprietary mixtures..	50·1	36·7	33·3	32·3	31·4	43·9	39·1	7·47
Sulphate of ammonia	15·8	18·4	14·6	18·4	15·0	17·6	16·8	9·88
Superphosphate ..	6·9	11·4	13·5	10·9	15·4	16·6	10·7	3·40
Dung	11·6	6·4	10·6	3·0	7·2	1·9	7·9	0·29
Soot	3·1	5·8	4·6	4·3	3·4	—	4·2	3·52
Nitrate of soda ..	2·9	6·5	5·4	2·5	3·0	4·3	4·1	9·82
Basic slag	1·4	1·9	4·7	4·9	3·4	1·7	2·9	2·65
Guano	1·4	1·3	—	5·4	4·3	0·7	2·2	8·45
Kainit	1·2	2·1	3·2	3·2	1·8	2·4	2·2	3·02
Bone super	0·7	3·9	1·4	1·5	1·0	2·2	1·8	5·37
Fish manure	0·2	0·4	3·3	4·3	0·3	—	1·5	1·84
Nitrate of lime ..	1·2	0·9	1·1	2·0	3·1	0·7	1·4	9·90
Lime	0·7	0·7	0·6	1·7	1·6	3·2	1·0	1·59
Muriate of potash ..	0·1	0·6	0·5	0·7	2·0	1·7	0·6	9·28
Miscellaneous (12 varieties)	2·7	3·0	3·2	4·9	7·1	3·1	3·6	—
Total expenditure ..	100·0	100·0	100·0	100·0	100·0	100·0	100·0	—

Between one farming district and another there are wide differences in the types and quantities of fertilisers applied. Table III in the Appendix compares the amounts expended on fertilisers in different localities, and shows a variation of from 2*s*. per acre on the Norfolk breck to nearly 6*s*. per acre on the south Cambridge gravels.

Although farmyard manure is not an item of cost in the same sense as purchased fertilisers, it is important to appreciate that it is still the principal fertilising agent employed. It is here that the inter-dependence of enterprises in a system of mixed farming is most clearly evidenced, the productivity of crops and livestock being apparently closely connected. On the average each "animal unit" (one animal unit is equivalent to 1 cow or bullock, all types and ages of livestock being converted to this common denominator) produced 10 loads of manure in the year, and dung was available at the rate of 3 loads per

arable acre. On the assumption that one load of dung weighs two-thirds of a ton, the plant food made available in this form was equivalent to approximately 24 lb. nitrogen, 10 lb. phosphate, and 24 lb. potash per arable acre. Had these elements been purchased in the form of sulphate of ammonia, superphosphate, and sulphate of potash respectively, the cost (at 1931 prices) would have been roughly 17*s.* 6*d.* It must be borne in mind, however, that dung serves a dual purpose, viz.: (1) to supply plant food, and (2) to benefit soil texture. An adequate humus content in the soil is of great importance, and the value of dung in maintaining this must be recognised.

Other means adopted to maintain fertility and to improve soil texture are sheep folding, and the ploughing in of mustard, rape, sugar beet tops, etc.

6. SEED

Rates of seeding and the proportions of purchased and home-grown seed used for the 1931 crops have already been referred to in the various sections of Chapter IV. It may, however, be convenient briefly to recapitulate this information. The total expenditure on purchased seed per farm in each size group is shown in Table II in the Appendix, while the items comprising the over-all average cost are shown in the following figures:—

	Average rate of seeding per acre.	% 1931 crop area grown from purchased seed.	Cost per unit of purchased seed.	% of total expenditure per farm on purchased seed.
			s. *d.*	
Wheat	2·5 bus.	35	37 8 (qr.)	12·1
Barley	2·9 bus.	38	41 2 »	20·0
Oats	3·9 bus.	31	25 5 »	6·3
Beans	3·1 bus.	23	35 11 »	1·3
Peas	3·4 bus.	33	38 8 »	1·1
Tares	2·5 bus.	62	5 3 (bus.)	0·3
Potatoes	14·2 cwt.	67	148 4 (ton)	14·6
Mangolds ..	7·2 lb.	100	1 2 (lb.)	6·1
Sugar beet ..	13·8 lb.	100	6½ »	4·1
Grass, clovers, etc.	—	—	—	26·8
Other crops ..	—	—	—	7·3
Total expenditure on purchased seed				100·0

It will be seen that the purchase of grass and clover seeds is the largest individual item, accounting for just over one-quarter of the total expenditure under this

heading. The smaller farms purchased a much larger proportion of their cereal seed than did the larger farms.

Size group. (acres).	% of crop area grown from purchased seed.		
	Wheat.	Barley.	Oats.
20–50	49	55	47
50–100	41	51	39
100–150	37	36	35
150–300	34	33	26
300–500	32	30	30
Over 500	25	34	22

Of the other crops enumerated, the proportion drilled with purchased seed does not vary much from one size group to another.

7. MISCELLANEOUS COSTS

The costs referred to in the previous six sections of this chapter cover 85 per cent. of the gross charges. The remaining costs aggregate just over £1 per acre of farmed land, and comprise a large number of petty disbursements detailed in Table IV of the Appendix. Under this heading the principal expense is in connection with machinery, implements and appliances, on which the outlay represents nearly one-third of the total. Next in importance

	% of total miscellaneous costs.
Purchases of, and repairs to implements, machinery and appliances (including motor vehicles, poultry huts, harness and small tools)	32
Coal, paraffin, oil and electricity	19
Hire of threshing and other tackle	12
Road and rail carriage	9
Other miscellaneous expenses	28
Total miscellaneous costs	100

come coal, paraffin, petrol, oil and electricity, at nearly one-fifth of the total; hire of threshing and other tackle represents 12 per cent.; road and rail carriage amounts to 9 per cent.; while a large assortment of other items (e.g. insurance, binder twine, veterinary, horse shoeing, etc.) make up the balance.

CHAPTER VI

MISCELLANEOUS ECONOMIC AND SOCIAL DATA

1. Equipment

The modern tendency to stress the possibilities of mechanisation justifies an examination of the present position. Table V in the Appendix shows the percentage of farms in the different size groups equipped with certain of the more important machines and appliances. Expressed as a percentage of all farms over 20 acres in size the proportion of holdings with certain equipment is as follows:—

Type of machinery or appliance.	Percentage of farms over 20 acres having this equipment.
Motor car	29
Fixed engine	29
Tractor	23
Telephone	12
Motor van	6
Threshing machine	5
Electricity	4
Steam engine..	1
Milking machine	1

(*a*) *Tractors.* Of farms of over 20 acres nearly one-quarter are equipped with tractors. On the smallest size group (i.e. 20–50 acres) 3 per cent. of the farms have a tractor, but the proportion rises rapidly in the larger size groups, until, on farms of over 500 acres, more than three-quarters are so equipped. On farms below 300 acres there is seldom more than one tractor per farm, but on larger farms two or more tractors are frequently kept.

The Fordson, representing nearly 60 per cent. of the total number, is the most common type of tractor; the International, representing 25 per cent., is second in popularity, while no less than 17 other types account for the remaining 15 per cent. The average number of days worked per tractor per annum is 85, although a quarter of the tractors worked less than 50 days, and only a fifth worked more than 100 days. The smaller farms averaged a considerably smaller number of working days per tractor per annum than the larger farms.

(*b*) *Motor Vans.* Only 6 per cent. of the farms of more than 20 acres have a motor van, although on farms of over 500 acres the proportion is as high as 27 per cent. Ford vans, representing 43 per cent. of the total, are the most common; Morris vans (33 per cent.) are second in importance, while 10 other makes (some of them converted motor cars) account for the remainder. Twenty-three per cent. of owners had vans rated at more than 20 cwt. capacity, while only 8 per cent. of owners had vans of 40 cwt. capacity or more.

(*c*) *Motor Cars.* Twenty-nine per cent. of farmers of more than 20 acres possess a motor car, which, like the telephone, is one of the most useful units of modern farm equipment. The average distance run per car per annum is 5000 miles, of which two-thirds is on farm and one-third on personal business.

(*d*) *Fixed Engines.* Twenty-nine per cent. of farms have a fixed engine, although in this connection it must be borne in mind that tractors are now frequently used for stationary work (e.g. grinding, threshing, wood-cutting, etc.), formerly performed by fixed engines.

(*e*) *Threshing Machines.* Five per cent. of all farms, and only 30 per cent. of those above 300 acres, have a threshing machine. For the principal cereal area of the country this proportion appears surprisingly low.

(*f*) *Steam Engines.* As might be expected, steam engines are seldom found among farm equipment, being provided, when required, by contractors.

(*g*) *Milking Machines.* Only 1 per cent. of farms have mechanical milkers. Such a calculation is, however, of little significance, for milking machines are of economic importance only where a dairy herd of 20 or more cows is kept. Of farms keeping 20 or more cows, roughly 10 per cent. are equipped with milking machines.

(*h*) *Telephone.* As much as 12 per cent. of farms are equipped with a telephone, although these are mainly found on farms over 300 acres in size. The convenience and advantages of a telephone for securing information on the state of the markets, or for making direct contact with purchasers, requires no emphasis.

(*i*) *Electricity.* Only 4 per cent. of holdings are equipped with electrical power or light. A few of the larger farms generate their own supply.

2. Size of Fields

Mechanised crop production implies large fields. The previous section on equipment may, therefore, be followed by a few words on the size of crop

units. It must be noted that in practice a number of different crops are frequently grown side by side in a single field (a "field" being the area enclosed by hedge, fence, bank, or ditch). From the point of view of mechanisation the *field area* is the important factor, but the figures given in this section refer to the area of individual *units* of crop.

For all soils and sizes of farms the average area of a unit of cereals was just under 8 acres. In order to obtain the most efficient use of combine-harvesters, this unit would have to be *at least* three times as large, while it has been estimated that a minimum of 350 acres of cereals is necessary for the economic utilisation of these modern machines.* As only 0·2 per cent. of holdings over 20 acres grew 350 acres or more of cereals in 1931 (all of these being over 500 acres in size), it is clear that considerable re-adjustment not only in size of crop unit, but also in size of farm, will be necessary before the use of combine-harvesters becomes a common feature of the Province. But there is great scope, and, indeed, the movement is proceeding as fast as capital resources permit, for the development of many labour-saving methods of production less dependent on prairie conditions than the combine.

Size group	Average area (acres) of a unit of:—	
(acres).	Cereals.	Permanent grass.
20–50	4·8	3·6
50–100	6·3	5·0
100–150	8·3	6·9
150–300	10·8	10·3
300–500	13·5	13·2
Over 500	17·3	19·7

The average size of permanent grass fields is just under 7 acres, ranging from 3·6 acres on the smallest size group to nearly 20 acres on the over 500 acres size group. The development of knowledge of scientific grass management suggests that small fields are the more advantageous, although it must be noted that the shortage of water throughout the Province is a limiting factor to the sub-division of pasture.

3. Drainage

Drainage, or rather lack of drainage, is an important factor in certain districts. For all soils and sizes of farms 14 per cent. of the total area is estimated to require draining, while only 5 per cent. of the total area has been drained during the past 5 years. The problem is most acute on the clays,

* Rothamsted Conferences, XIV, *Mechanisation and British Agriculture*, 1932.

where 26 per cent. of the land requires draining, and only 8 per cent. has been drained during the past 5 years:—

Soil.	Percentage of total area which requires draining.	Percentage of total area drained during past 5 years.
Clays	26	8
Loams	13	4½
Gravels	3	¼

Between one locality and another there are marked variations in drainage requirements and the amount drained during the last 5 years. Particularly on the Huntingdon and west Cambridge clays, the north Essex boulder clays, the central Suffolk heavy loams, and the south Essex london clays, capital for drainage purposes is of vital importance.

District.	Percentage of total area which requires draining.	Percentage of total area drained during past 5 years.
Hunts. and W. Cambs. clay	32·0	5·6
N. Essex boulder clay	30·5	18·5
Cent. Suffolk heavy loam	21·8	9·7
S. Essex london clay	15·4	2·9
Central Norfolk light loam	8·1	1·6
S. Herts. gravel	3·2	—
N.E. Suffolk sand and gravel ..	1·9	—
S. Cambs. gravel	1·5	0·6
S.E. Suffolk & N.E. Essex sand and gravel	0·6	0·2
Norfolk breck	—	—

4. Private Drawings in Kind

It has already been explained (page 14) that in calculating the gross farm charges no credit has been given either for the rental value of, and local rates on, the dwelling-house, or for material (e.g. coal, paraffin, etc.) drawn out of farm stores for use in the farmer's household. Similarly in calculating the gross farm income no allowance has been made for farm produce (e.g. milk, butter, etc.) consumed by the farmer and his family. Collectively, these private drawings in kind aggregate a considerable sum, ranging from £46 per annum on farms of 20–50 acres in size up to £115 on farms of over 500 acres. The items comprising these totals are detailed in the following figures:

Size group.	Estimated value (£) of private drawings in kind.					
	20–50 acres.	50–100 acres.	100–150 acres.	150–300 acres.	300–500 acres.	Over 500 acres.
	£	£	£	£	£	£
Rent and rates of house ..	17·5	20·5	27·0	31·3	37·4	52·1
Milk	6·5	7·8	9·4	10·1	11·8	12·8
Butter	3·3	3·4	3·6	3·6	3·8	4·9
Eggs	5·3	6·0	5·8	6·6	6·6	6·6
Poultry	1·5	2·1	2·4	3·2	3·6	4·5
Fruit and vegetables ..	4·0	3·6	4·3	4·8	5·8	5·0
Coal	4·0	3·7	4·3	5·1	4·7	5·5
Paraffin, gas, or electricity ..	1·6	1·6	2·1	2·3	2·0	2·1
Prop'n. motor car costs ..	1·5	2·5	4·9	7·6	9·4	12·5
Prop'n. telephone costs ..	0·1	0·2	0·3	0·4	0·7	1·5
Labour	0·3	0·2	0·5	1·4	2·3	7·8
Total	45·6	51·6	64·6	76·4	88·1	115·3

Produce used in the farmhouse comprises milk, butter, eggs, poultry, an occasional pig, fruit and vegetables. On the assumption that these commodities would otherwise have been sold, they have been valued at market price, which is a retail price only in those cases where retailing is practised. This assumption is not, of course, valid in all cases, for the household not infrequently absorbs surplus or low-grade produce, which has no market value.

The gross output figures given in other sections of this *Report* do not include private drawings in kind, although these have been taken into consideration in calculating milk yield per cow and egg yield per hen.

5. Vocational Experience of Occupiers

Three-quarters of the occupiers of holdings over 20 acres have always been farmers; nine per cent. are ex-farm workers; while 16 per cent. were previously members of some trade or profession:

Size group. (acres.)	Vocational experience of occupiers:—		
	Always been a farmer.	Originally a farm worker.	Originally in other profession.
	%.	%.	%.
20–50	64	17	19
50–100	68	10	22
100–150	83	3	14
150–300	88	3	9
Over 300	88	2	10

Two-thirds of the occupiers came from farming stock (i.e. their fathers were farmers), although the proportion ranged from one-half in the smallest size group, to four-fifths in the over 500 acres size group.

Less than $2\frac{1}{2}$ per cent. of the occupiers had taken part in any College or Institute course in agriculture. The proportion ranged from 0·5 per cent. of occupiers of 20–50 acres, up to 13 per cent. of occupiers of over 500 acres.

6. Co-operation

Eleven per cent. of occupiers were associated with either a co-operative purchase or a co-operative marketing society. The proportion was least on the smaller farms (average on farms below 150 acres = 8 per cent.) and greatest on the larger farms (average on farms over 150 acres = 18 per cent.). The numbers associated with each of these two types of co-operative society were approximately equal.

7. Farm Accounts

Fourteen per cent. of the occupiers kept financial accounts of their farm business. On the 20–50 acres size group the proportion was smallest at 5 per cent., while three-quarters of the farmers of more than 500 acres kept accounts. It appears that accounts are kept primarily for income tax purposes, and that their potentialities as a guide to management are seldom appreciated.

CHAPTER VII.

FACTORS INFLUENCING PROFITABLENESS

THE previous chapters of this Report have been confined mainly to a description of the economic organisation and financial results of the agriculture of the six principal corn growing counties of England in 1931. The relative importance of the various products and costs has been shown, conditions affecting production have been described, and comparisons have been drawn between farms of different sizes, and between different agricultural localities. But while such data are of value for administrative purposes, the individual producer has neither the inclination nor the time to study statistics of this nature. Particularly in a period of economic depression, when he is fully employed endeavouring to meet his liabilities, the farmer is likely to appreciate only such material as directly contributes to his assistance.

The factors influencing the profitableness of farming may be divided into two categories, viz.: (1) factors outside the control of the individual farmer (e.g. prices, climatic conditions, etc.), and (2) factors under the complete or partial control of the individual producer (e.g. types and methods of production, etc.). The former have exerted undue influence on the fortunes of farmers in the eastern counties during the past ten years, for national and world economic forces have conspired to upset the normal equilibrium between prices and costs. It is true that, assuming a "free" market, costs will eventually adjust themselves to an economic level, but the invariable "lag" in this adjustment (particularly marked in agricultural production) proves a severe handicap to farmers in times of falling prices, while a "free" market for labour, the farmer's largest item of expense, does not exist in England. Farming capital has depreciated by two-thirds since 1921, while the relative weight of fixed charges has increased with each rise in the purchasing power of money. Farmers have also been handicapped technically and psychologically, for the conditions to which methods of production had been adapted through a generation of experience have, during a few brief years, been materially altered. Confidence has been lost, while new methods of production, still largely experimental, cannot be freely tested on account of shortage of working capital.

In times of prosperity agricultural practices alter slowly, but in times of adversity rapid re-organisation becomes imperative. Economic forces, never very stable at the best of times, and particularly uncertain during recent years, demand deference. So long as price and cost levels continue to fluctuate producers must constantly scrutinise their management, and be prepared to adjust, and then to re-adjust their organisation. In effecting such adjustments the farmer's power is limited to those factors under his control; no more than any other individual can he influence general economic forces to suit his organisation—Mohammed must go to the mountain.

In considering the advisability of modifying his organisation to meet current economic conditions, the individual farmer will naturally take into account the effect of the proposed change on his farm business *as a single unit.* The highest possible profit on his farm as a whole, and not the highest net return on any particular department of his farm, will be his objective. Are there any business principles which might act as a guide to the individual farmer deliberating upon a change in policy? The results of the present investigation suggest that there are, although much remains to be done in the way of statistical analysis and interpretation of the data.

1. EFFICIENCY IN THE USE OF LABOUR

It is perhaps unnecessary to draw attention to the fact that the principal points in planning to secure maximum profit are connected with the *relative* price levels of products and requirements, although in farming other considerations must also be taken into account. At the present time labour is not only the most expensive of farm requirements, but it is also the largest individual item of the farmer's outgoings. Foods, fertilisers, and rents are approximately at their pre-war cost level, while labour is generally estimated to be 100 per cent. above the pre-war base. For this reason economy in the use of labour is of primary importance. But on account of the inelasticity of wages the only means open to the farmer of economising in this direction is to increase the efficiency with which he applies his labour forces; that is to raise the money value of the output from every £1 spent on wages.

The influence of the productivity of labour on profitableness is illustrated by the following figures referring to the farms covered by the present investigation:—

Size group (acres).	Average output per £100 manual labour.*	Average profit surplus (£) per farm where the gross output per £100 manual labour* was:		
		More than 20% below group average.	From 20% below to 20% above group average.	More than 20% above group average.
20–50	187	—172	— 92	+ 21
50–100	183	—294	—155	+ 66
100–150	203	—333	—186	+143
150–300	212	—512	—258	+118
300–500	215	—860	—336	+252
Over 500	215	—1288	—449	+394

It is clear that a very close relationship exists between output per unit of labour and profitableness; the sequence in favour of a high output is unbroken in each size group, and the difference in profitableness between highest and lowest efficiency is very wide. Approximately one-third of all farms in the Province achieved an output of less than £150 per £100 worth of labour, and on these there was an average *deficit* of over £330 per farm; one-third secured an output of between £150 and £220 per £100 labour, and here the *deficit* averaged £230; the remaining third obtained an output of more than £220 per £100 labour, and on this group there was a *surplus* of £40 per farm.

Extensive methods of production tend to give a high output per unit of labour, but, in such a densely populated country as England, the possibilities of such methods are limited. A complete revolution in social conditions (e.g. number of occupiers and workers) would be necessary if extensive methods were to be generally adopted,† to say nothing of the capital which would be required to re-distribute farms and fields, and to equip farms with the necessary machinery. Certainly there is considerable scope for increasing labour efficiency by the modernisation of power and equipment. Developments in labour saving machinery and appliances have been so rapid in recent years,

* Includes family labour.

† Approximately three-quarters of the total number of holdings of 1 acre or more enumerated in the statistics of the Ministry of Agriculture, are under 100 acres in size, and less than 6 per cent. are over 300 acres. Certain districts in the eastern counties, in particular the less fertile soils remote from urban centres, can, at current price levels, be made economically productive only under extensive large-scale methods of production.

and the economic outlook has been so depressing, that it is little wonder if equipment has in many cases become obsolete. Tractors could, no doubt, be employed economically more widely than at present; electricity, if made available at a reasonable cost, could be utilised with advantage, particularly for pulping, grinding, chaffing, threshing and milking machinery; while hay-making appliances could lessen considerably the labour in the hay field. Considering the scarcity of working capital and the uncertainty of the economic outlook, re-equipment is proceeding rapidly.

While the modernisation of equipment, and the careful supervision of labour will increase efficiency, there is another way by which improvement in this direction may be secured. Certain enterprises yield a higher output per unit of labour than others, and the introduction of such enterprises, or their intensification if already present, will increase the labour efficiency of the farm. During recent years livestock have given a higher output per unit of labour than crops (see Table below), but it is clear that changing price levels will cause constant fluctuation in the relative position of different enterprises.

Size group (acres).	Average livestock density (A.U.)*	Output (£) per £100 labour on farms having a livestock density*:		
		More than 20% below group average.	From 20% below to 20% above group average.	More than 20% above group average.
20–50	28·1	149	159	229
50–100	21·1	141	162	238
100–150	19·8	156	206	261
150–300	17·4	183	196	265
300–500	14·2	178	211	258
Over 500	14·2	205	226	247

It is not suggested that it is possible, or even desirable, in the eastern counties to concentrate entirely on the production of livestock, for geological and climatic conditions are unfavourable to grass farming over a large area of the Province, while a change in the relative price levels of crops and livestock may soon be brought about either by political or economic influences.† But considerable latitude is available not only in the choice of enterprises and in the proportions in which the various enterprises are combined, but also in the form in which produce can be marketed, and the emergency is too pressing to over-look any possible means of relief.

* Livestock density is measured in terms of animal units (A.U.) per 100 acres, see page 15.

† See page 28.

2. RATE OF CAPITAL TURNOVER

A quick turnover is advantageous because it reduces capital costs per unit of output. Compared with other industries, agriculture is handicapped by the slow turnover which its dependence on nature imposes. For the eastern counties in 1931 the output averaged only £65 for every £100 worth of farm capital, but certain farmers secured a quicker turnover than others, and the following figures illustrate the effect on profitableness of these variations:—

Size group (acres).	Average output per £100 capital (£).	Average profit surplus (£) per farm where the gross output per £100 farm capital was:		
		More than 20% below group average.	From 20% below to 20% above group average.	More than 20% above group average.
20–50	76	−185	−104	+ 50
50–100	69	−285	−132	+ 70
100–150	68	−351	−145	+146
150–300	64	−495	−264	+193
Over 300	59	−873	−461	+335

It is apparent that profitableness is closely associated with rate of turnover. Approximately one-third of all farms achieved a turnover of 50 per cent. or less, and on these there was a *deficit* of nearly £380 per holding; one-third secured a turnover between 50 per cent. and 70 per cent., and here the *deficit* was £230; the remaining one-third obtained a turnover of over 70 per cent. and on these farms there was a *surplus* of nearly £40.

Size group (acres).	Average livestock density (A.U.).	Rate of capital turnover (%) on farms having a livestock density:		
		More than 20% below group average.	From 20% below to 20% above group average.	More than 20% above group average.
20–50	28·1	61	67	90
50–100	21·1	56	59	84
100–150	19·8	56	65	78
150–300	17·4	57	60	70
Over 300	14·2	53	59	64

Speaking generally, livestock give a quicker turnover than crops (see Table above), although certain livestock enterprises give a more rapid turnover than others. For example, store cattle and breeding flocks of sheep allow a comparatively slow turnover, while pigs, poultry, and dairy cattle permit of a quick turnover.

3. EFFICIENCY IN LIVESTOCK PRODUCTION

As livestock enter so largely into the rural economy of the eastern counties, the efficiency with which they are produced exerts an important influence on farm profits. In the production of livestock and their products, foodstuffs comprise approximately two-thirds of the total costs, and a reasonable measure of efficiency of production can therefore be obtained by expressing the value of the livestock output on the basis of a unit (say £100) of food costs. Admittedly this measure fails to differentiate between efficiency secured in production, and advantages which result from special marketing facilities, e.g. a farmer may obtain a high output per unit of food cost by good breeding and the consistent use of balanced rations and economical feeds, or by obtaining a relatively high price for his produce. But as the effect on profits of either these alternatives is of the same nature. and for lack of a better method of expression, the value of the livestock output per £100 worth of foods consumed may be accepted as providing at least a rough index of economic efficiency in livestock production.

For all farms in the Province each £100 worth of foods (purchased plus home grown, including pasture) consumed by livestock yielded on the average £190 worth of produce. There was, however, a wide variation in this measure between one farm and another, and the following table illustrates the influence of this variation on profits.

Size group (acres).	Average livestock output per £100 foods. (£).	Average Profit surplus (£) per farm where the livestock output per £100 foods was:		
		More than 20% below group average.	From 20% below to 20% above group average.	More than 20% above group average.
20–50	199	−186	− 93	− 3
50–100	195	−269	−149	+ 4
100–150	198	−344	−117	+ 46
150–300	183	−464	−177	− 2
300–500	171	−700	−316	+138
Over 500	161	−1052	−597	+293

Approximately one-third of the farms secured less than £140 worth of livestock output per £100 worth of foods, and on these there was an average *deficit* of £370 per holding; one-third achieved a livestock output between £140 and £209, and here the *deficit* averaged £180; the remaining one-third obtained more than £209 livestock output per £100 worth of foods consumed, and on these farms there was an average *surplus* of £3.

4. VALUE OF OUTPUT

In Chapter II attention has been drawn to the fact that size of business is an economic factor which must be taken into account in discussing profitableness. It is customary to express the size of a farm in terms of acres, but that this measure is unsatisfactory is readily apparent. Ten acres of fertile land entirely devoted to the production of market garden crops may involve as much capital outlay, and yield the same value of produce, as 500 acres of poor land producing grain and sheep; and although to the lay mind the former farm is a small holding, it is, in effect, as large a business unit as the latter. This illustration emphasises the fact that in measuring the size of business it is necessary to consider not only the area covered, but also the degree of intensity of production. The best individual measure for expressing the size of the farm business is the annual value of the gross ouput.

As, in agriculture, the profit margin per unit of produce is generally small, large profits can only be made where the output is relatively great. A profit margin of one penny per gallon gives a negligible income on 100 gallons of milk, but a considerable return on 10,000 gallons. Similarly, if a farm has a gross output of only £500 the occupier's chance to secure reasonable income is small, as it would require a 20 per cent. profit margin to yield him £100. At the same time it must be borne in mind that while a small business cannot be expected to yield a large profit, it runs less risk of realising a heavy loss than a large business (see page 22).

But there is another aspect of production which is more complicated than that mentioned in the previous paragraph, and which is particularly difficult to discuss at the present time. In a period of falling prices, profit margins can only be maintained either by increasing total output or by decreasing total costs. In so far as reduction in price levels is due to world over-production (or under-consumption, whichever term is preferred), it is obvious that the interest of producers will be best served by restricting production. From this point of view it is better to aim at decreasing costs of production rather than at increasing output. An example of this form of adjustment is the grading up of livestock to get, say, the same number of

pigs from a smaller number of sows. So far as this type of re-organisation is possible, it is recommended as being likely to prove of most permanent value to the agricultural community as a whole.

In farming practice, however, costs per productive unit are inelastic. For example, on a particular farm a certain number of men and horses must be kept, rent must be paid, and upkeep charges defrayed irrespective (within limits) of production. Indeed, in arable farming approximately two-thirds of the total costs of production are more or less fixed, and frequently the occupier has little opportunity to reduce, apart from fertilisers and feeding stuffs, his total outgoings. In such circumstances an increase in the total output must be attempted, without consideration of the effect on world supplies. This form of adjustment may be achieved by greater concentration on livestock enterprises (*vide* the dependence of the small farmer on livestock), by laying greater stress on relatively high value products, by exploiting any form of side-line which local conditions favour, or, in certain cases, by the more intensive production of existing enterprises.*

The following figures illustrate the influence of value of output on profitableness in the eastern counties in 1931. It is clear that *in each size group*

Size group (acres).	Average gross output per farm (£).	Average profit surplus (£) per farm where the gross output was:		
		More than 20% below group average.	From 20% below to 20% above group average.	More than 20% above group average.
20–50	365	−161	− 89	+ 8
50–100	550	−249	−164	+ 6
100–150	885	−297	−248	+111
150–300	1292	−403	−248	− 2
Over 300	2355	−647	−501	+ 62

there is a marked tendency for losses to be greatest where the output has been least, and the discontinuity in the vertical reading of the last column is not significant. There are undoubtedly many related influences (e.g. marketing facilities, etc.), affecting this sequence, but the general effect of a large output reducing fixed costs per unit of produce is evident. The farms with the greatest output have achieved their position largely by concentrating on livestock enterprises, which, during recent years, have been comparatively

* Thirty per cent. of farmers in the eastern counties bought no fertilizers during the year 1931, see page 62.

Size group (acres).	Average livestock density (A.U.).	Gross output (£) per farm where the livestock density was:		
		More than 20% below group average.	From 20% below to 20% above group average.	More than 20% above group average.
20–50	28·1	256	313	515
50–100	21·1	379	469	804
100–150	19·8	658	849	1213
150–300	17·4	912	1243	1736
300–500	14·2	1296	1782	2550
Over 500	14·2	2728	3625	4781

profitable. But there is not wanting evidence that a critical point in livestock production is nearly reached,* although, on account of the uncertain political and economic position, forecasts of future trends can be of little value. It may be said, however, that the price level of livestock is of much greater importance to the majority of eastern counties farmers than is that of cereals, and that if the relative level of livestock prices is much further depressed the outlook for producers in the area, particularly the smaller farmers, is indeed unhappy.

5. INTERPRETATION OF FARM ACCOUNTS.†

Variation is the most familiar characteristic of agricultural production—variation from district to district, from farm to farm, and from field to field in natural and economic conditions, variation between one season and another in climatic conditions, and variation in the way in which even similar natural and economic influences are utilised by different farmers. Each cow has to be considered individually, each field has to be treated on its merits, each season has to be met in different manner from its predecessor, and all the time price and cost levels are subject to continual fluctuation.

It is obviously impossible to invent a key to profitableness for general, or even local, application (even Thomas Tusser got the length of *Five Hundreth good Pointes of Husbandry*)—opportunism plays too big a part. It is certain, however, that business methods must in future enter much more largely

* For the first six months of 1932 the average prices of feeding stuffs were 18 per cent. higher, and of livestock and livestock products 13 per cent. lower, than those ruling during the same period in 1931.

† A short pamphlet (*Farmers' Bulletin*, No. 1) outlining in detail a method of interpretation, can be obtained free of charge on application to the Advisory Economist, Cambridge University Department of Agriculture.

into the farmer's daily duties than they have in the past. The need for avoidance of waste (in the widest meaning of the word), whether of labour, capital, or materials, will necessitate the recording of transactions, and the preparation and intelligent interpretation of financial statements.

Interpretation of such statements will be facilitated by a knowledge of the most important factors influencing profits, and the previous sections of this chapter have suggested four general factors which merit special scrutiny, viz.:—

(1) Efficiency of labour measured in terms of the gross output per £100 worth of labour.

(2) The rate of capital turnover.

(3) The efficiency of livestock production measured in terms of the gross livestock output per £100 worth of foods.

(4) The size of the farm measured in terms of the gross output.

These, then, are the points which should receive first attention when interpreting the farm Profit and Loss Account. But to assess the position of the farm organisation under each heading some form of "yardstick," some standards of comparison, will be required. Failing a better basis, business efficiency factors may be measured in terms of their variation from average, or "normal," standards, for such a method gives the individual farmer at least some idea of how the efficiency of his organisation compares with that of his neighbours. "Normals" for each of the four principal factors have been shown in the earlier sections of this chapter. In the following table comparison is made of the returns secured by the occupiers of those farms which were below "normal" in each of the four factors, with those obtained on farms above "normal" in one or more of the factors taken in the order shown above.

Size group (acres).	Profit surplus (£) per farm on holdings below group "normal" in all four factors.	Profit surplus (£) per farm on holdings above group "normal" in factor:			
		1.	1 and 2.	1, 2 and 3.	1, 2, 3 and 4.
20–50	−184	− 9	+ 20	+ 97	+146
50–100	−294	+ 4	+ 44	+119	+134
100–150	−337	+27	+ 96	+143	+205
150–300	−492	+38	+138	+224	+257
Over 300	−906	+61	+207	+337	+461
All together	−349	+17	+ 82	+165	+209

One-third of the farms were below "normal" in each of the above four factors, and on these there was an average deficit of £349. Two-fifths of the farms were above "normal" in Factor 1, and in this group there was a surplus of £17. One-third of all farms were above "normal" in Factors 1 and 2, and in this case the average profit surplus was £82. One-fifth of farms were above "normal" in Factors 1, 2, and 3, and only one-sixth in all four factors, and on these the profit surplus averaged £165 and £209 respectively.

Comparison of the financial results of the individual farm on some such basis as has been suggested will give the occupier at least a rough idea of the direction in which possible weaknesses in his economic organisation may lie. The next step must be an attempt to investigate more closely any suggested maladjustments. For example, the preliminary diagnosis may show, say, that the livestock output per £100 foods is below normal. This may be due, however, to one or all of a number of causes, common to each, or confined to only one, of the livestock enterprises on the farm. The important thing is to carry the investigation to a conclusion (and here ration records and cost estimates will be of value), and to determine the exact reason, or reasons, for the sub-normal livestock efficiency. Lastly it will be necessary to consider what modifications are desirable in view of obvious weaknesses in the present organisation, and probable price changes in the future. For example, should more wheat be grown at the expense of the barley area; should cows be reduced in number and more pigs and poultry kept; should the temporary grass be allowed to lie for three years instead of one or two, and more sheep and store cattle introduced; is there an opening for a few acres of potatoes; should more oats be grown and less concentrated foods purchased; are there any side-lines that can be exploited; are there any labour-saving devices which can profitably be employed; can surplus milk be more advantageously marketed as cream or as butter, or should it be sold as whole milk for what it will fetch, or would it be more economic to feed it to pigs and young stock; are pig prices likely to rise or fall during the coming year?

These, and a hundred similar questions will require consideration when preparing a working plan for future operations, and to assist in clarifying the issue it is helpful to draw up an annual "budget" estimate. The object of preparing a budget is, of course, to take advantage of past errors in judgment and future movements of prices. Admittedly it is impossible accurately to foretell price fluctuations, but a conscious attempt to plan in advance is more likely to yield satisfactory results than is entire dependence on chance. In setting down the expenditure items in the budget it is advisable to differentiate between the more or less fixed costs, and those which are primarily dependent on the organisation selected. So far as fixed costs are concerned the past

year's records will provide the necessary basis of calculation. In arranging for the most desirable combination of enterprises, consideration will have to be given not only to relative price levels and local natural and economic conditions, but also to the labour requirements of the different enterprises, and to the seasonal variation of these requirements. In addition to the selection and combination of enterprises, scope for re-adjustment is sometimes to be found in alternative forms of marketing produce. For example, in the dairy enterprise, apart from the alternatives of wholesale and retail trading, surplus milk might be marketed as cream or butter, or it might be fed to pigs and young stock as part, or whole, of the protein ration. Pork, bacon, and stores provide alternatives for the pig enterprise, while veal, baby beef, stores, or dairy heifers are alternative outlets for calves.

Needless to say, much yet remains to be done in the way of developing a technique for interpreting farm accounts. In the first place some system of classification of farms by type of organisation is necessary, for the determination of the most important business factors and efficiency standards for each of the various types would prove a highly desirable refinement of technique. Again "enterprise efficiency services" for such important departments as dairy cattle and pigs would link production recording with the co-equally important item of cost; while an increased knowledge of the comparative utility of various types of machinery and implements would provide the farmer with a trustworthy basis of selection. Further, the development of a price forecasting service would be of very real benefit to farmers, provided the information was made available promptly. Farm budgeting cannot be of fullest use unless the individual farmer has some basis for estimating in advance the probable movements of demand and price.

Table I.

AGRICULTURAL STATISTICS FOR NORFOLK, SUFFOLK, ESSEX, HERTFORDSHIRE, CAMBRIDGESHIRE, ISLE OF ELY† AND HUNTINGDONSHIRE

Year.	1885	1900	1910	1920	1930
CROPS AND GRASS (ACRES).					
Total area except water	—	4,416,728	4,417,240	4,417,240	4,414,400
Total area under crops and grass	3,747,861	3,660,314	3,645,837	3,599,277	3,436,113
Arable land	—	—	2,548,714	2,605,344	2,326,272
Permanent grass for hay	308,145	305,677	362,143	288,206	348,844
Permanent grass not for hay	615,365	758,290	734,980	705,727	760,997
Rough grazing	—	—	—	73,416	171,643
Wheat	623,142	524,093	554,900	515,790	411,492
Barley	616,204	522,357	456,708	489,947	427,716
Oats	179,445	267,491	287,771	311,651	258,189
Mixed corn	—	—	—	8,777	7,675
Rye	15,965	10,348	12,195	30,325	12,779
Beans	131,632	92,841	112,699	99,543	72,821
Peas	82,392	48,553	64,937	63,557	48,474
Potatoes	41,054	59,119	65,689	96,156	75,719
Turnips and swedes	261,321	219,160	197,753	168,581	92,418
Mangolds	141,068	141,936	145,128	122,611	92,767
Sugar beet	—	—	—	—	195,963
Cabbages, kohlrabi and rape	27,243	34,889	26,767	28,005	23,165
Vetches and tares	116,312‡	82,667‡	17,921	36,651	26,044
Lucerne	—	—	30,280	23,044	22,031
Small fruit	—	10,476	17,312	17,446	23,364
Orchards	—	—	—	—	31,790
Clover and rot. grass for hay	312,063	343,372	323,883	308,350	309,279
Clover and rot. grass not for hay	139,079	147,204	87,423	75,787	56,984
Other crops	5,244	83	39,045	73,246	56,960
Bare fallow	132,187	91,758	108,303	135,877	91,778
LIVE STOCK (NUMBER).					
Horses for agricultural purposes	144,909	150,376	157,076	125,344	111,565
All horses	198,182	205,806	209,692	199,560	148,353
Cows in milk	120,454	137,089	113,553	111,902	133,447
Cows and heifers in calf			36,133	41,365	47,047
Bulls				6,020	6,365
Other cattle—2 years and over	114,089	108,228	103,936	83,283	74,009
„ 1 year and under	162,881	181,603	107,657	89,188	93,170
„ under 1 year			92,220	70,961	79,497
Total cattle	397,424	426,920	453,499	402,719	433,535
Ewes		648,034	575,789	263,926	306,003
Rams and ram lambs	1,109,643	330,897	291,158	5,804	6,836
Other—1 year and over				156,037	97,751
under 1 year	842,972	713,522	661,368	315,189	353,442
Total sheep	1,952,615	1,692,453	1,528,315	740,956	764,032
Sows		55,734	54,151	54,262	60,082
Boars	428,059	370,798	376,112	4,537	4,594
Other pigs				247,686	402,429
Total pigs	428,059	426,532	430,263	306,485	467,105
Fowls	1,302,255			2,912,173*	6,109,195
Ducks	299,745			371,317*	452,172
Geese	55,423			36,566*	37,983
Turkeys	102,975			125,480*	163,686
HOLDINGS (NUMBER).					
1– 5 acres	13,444		10,693	10,469	9,676
5– 20 „	10,684		17,304	11,252	10,393
20– 50 „	6,262			7,509	7,345
50–100 „	4,965			5,700	4,751
100–150 „	7,808		13,516	3,318	3,243
150–300 „				4,863	4,619
Over 300	3,223		2,955	2,691	2,541
Total above 1 acre	46,386		44,468	45,802	43,568
WORKERS (NUMBER).					
Reg. Males over 21				93,759*	93,081
„ „ under 21				24,827*	18,477
„ Women and girls				5,970*	5,116
Cas. Males over 21				14,719*	15,387
„ „ under 21				4,102*	1,849
„ Women and girls				9,737*	6,606
Total				153,114*	140,516

† Isle of Ely not included in scope of present investigation.
* Statistics for 1921. ‡ Includes other green crops.

Table II

SIZE GROUPING (Figures "per farm.")

ECONOMIC AND FINANCIAL DATA

All figures expressed "per farm."

SIZE GROUPING (Figures "per farm.")

Size group (Acres)	Number of farms in group	Average size	Arable area	Livestock units	Manual workers*	Landlord's capital	Farm capital	Gross income	Gross charges	Gross output	Farm income	Allowance for occupier's labour	Investment income	Interest at 5% on farm capital	Labour income	Profit surplus	Private drawings in kind
		Acres	Acres	No.	No.	£	£	£	£	£	£	£	£	£	£	£	£
20–50	189	36	23	10·1	2·0	923	483	413	385	365	(+) 28	107	(−) 79	24	(+) 4	(−)103	46
50–100	262	74	49	15·6	3·1	1581	796	644	644	550	nil	116	(−)116	40	(−) 40	(−)156	52
100–150	157	126	79	24·9	4·5	2582	1304	1015	993	885	(+) 22	123	(−)101	65	(−) 43	(−)166	65
150–300	229	218	130	38·0	6·1	3847	2032	1499	1504	1292	(−) 5	138	(−)143	101	(−)106	(−)244	76
300–500	109	392	241	55·8	9·0	6470	3259	2280	2304	1901	(−) 24	158	(−)182	163	(−)187	(−)345	88
Over 500	37	762	468	108·3	18·0	10515	6160	4168	4228	3694	(−) 60	148	(−)208	308	(−)368	(−)516	115

* Including family labour.

Size group (Acres)	Distribution (£) of Farm Capital:—								Distribution (Acres) of 1931 Cropping:—								
	Dairy cattle†	Other cattle	Sheep	Pigs	Poultry	Horses	Crops and tenant right	Implts. and appliances	Perm. grass§	Temp. grass	Wheat	Other cereals‡	Fallow crops	Bare fallow	Pulse crops	Other crops	Bldgs., waste, roads, etc.§
20–50	81	25	2	26	34	42	171	102	11·4	4·4	4·2	7·5	4·6	0·8	1·4	0·6	1·1
50–100	136	48	12	33	33	71	304	159	22·7	9·7	8·9	16·7	7·6	2·8	2·5	0·7	2·6
100–150	208	95	31	46	47	107	523	247	42·1	17·0	13·8	25·8	11·7	5·1	3·6	2·0	4·6
150–300	293	190	96	61	60	150	814	368	78·1	29·1	24·8	42·3	18·7	7·1	5·7	2·6	9·6
300–500	374	319	192	103	71	231	1328	641	126·4	55·2	46·0	78·5	28·1	17·4	11·8	3·6	24·7
Over 500	605	451	715	215	87	457	2643	987	253·1	114·3	78·6	154·9	69·6	29·8	16·1	5·0	41·1

† Cows, in-calf heifers and bulls.

‡ Rye represents less than ½% of the farmed area.
§ Rough grazings have been allocated in equal proportions to pasture and to waste.

Size group (Acres)	Distribution (£) of Gross Income:—										Distribution (£) of Gross Charges:—						
	Dairy produce	Horned stock	Pigs	Poultry and eggs	Sheep and wool	Wheat	Barley	Sugar beet	Other crops	Miscel-laneous	Labour	Food-stuffs	Livestock	Rent	Fertilisers	Seeds	Miscel-laneous*
20–50	107	48	70	84	7	12	21	14	41	9	109	104	48	54	7	10	53
50–100	194	94	85	92	16	25	48	31	42	17	218	118	93	92	14	18	91
100–150	251	180	118	126	35	42	72	46	125	20	359	172	132	136	24	28	142
150–300	365	266	135	143	99	78	118	75	180	40	552	236	208	202	42	41	223
300–500	422	475	194	165	216	159	223	84	283	59	847	286	379	317	75	66	334
Over 500	719	567	472	181	528	416	439	298	442	106	1707	530	474	504	186	114	713

* Analysed in detail on p. 87.

Table III

LOCALITY GROUPING (Figures "per 100 acres.")

ECONOMIC AND FINANCIAL DATA

All figures expressed "per 100 acres farmed land."

LOCALITY GROUPING (Figures "per 100 acres.")

District	Average size of farm (Acres)	Arable area	Live-stock units	Manual workers*	Land-lord's capital	Farm capital	Gross income	Gross charges	Gross output	Farm income	Allowance for occupier's labour	Investment income	Interest at 5% on farm capital	Labour income	Profit surplus	Private drawings in kind
		%	No.	No.	£	£	£	£	£	£	£	£	£	£	£	£
1. Central Norfolk light loam ..	115	69	22·1	3·7	2196	1088	810	856	649	(−) 46	109	(−)155	54	(−)100	(−)209	55
2. Norfolk "breck"	352	50	11·8	1·8	925	638	401	394	344	(+) 7	32	(−) 25	32	(−) 25	(−) 57	17
3. Central Suffolk heavy loam	130	72	17·1	3·4	1759	973	612	676	524	(−) 64	92	(−)156	49	(−)113	(−)205	40
4. N.E. Suffolk gravel	221	51	12·3	2·6	1168	702	534	568	439	(−) 34	64	(−) 98	35	(−) 69	(−)133	24
5. S.E. Suff. & N.E. Essex gravel	140	61	21·2	4·0	1764	1168	1001	882	891	(+)119	100	(+) 19	58	(+) 61	(−) 39	54
6. N. Essex & S.W. Suff. b. clay..	206	76	11·8	2·9	1519	791	531	592	477	(−) 61	59	(−)120	40	(−)101	(−)160	30
7. S. Essex london clay	171	23	25·2	2·4	1407	976	811	725	719	(+) 86	85	(+) 1	49	(+) 37	(−) 48	51
8. S. Herts. gravel	184	45	19·6	3·3	2405	950	875	840	777	(+) 35	56	(−) 21	47	(−) 12	(−) 68	31
9. S. Cambs. gravel	210	86	13·0	3·0	2119	961	744	755	607	(−) 11	56	(−) 67	48	(−) 59	(−)115	33
10. Hunts. and W. Cambs. clays	225	61	13·2	2·3	1497	738	450	484	404	(−) 34	59	(−) 93	37	(−) 71	(−)130	29

* Including family labour.

District	Distribution (£) of Farm Capital:—								Distribution (Acres) of 1931 Cropping:—								
	Dairy cattle†	Other cattle	Sheep	Pigs	Poultry	Horses	Crops and tenant right	Implts. and appliances	Perm. grass§	Temp. grass	Wheat	Other cereals‡	Fallow crops	Bare fallow	Pulse crops	Other crops	Bldgs., waste, roads, etc.§
1	154	99	50	32	28	88	454	183	28·1	15·5	10·5	25·6	14·6	1·1	1·1	0·4	3·1
2	71	48	93	14	7	48	254	103	34·7	11·9	3·1	21·0	12·2	1·4	0·7	0·1	14·9
3	90	70	25	58	33	95	382	220	23·2	14·0	16·0	22·2	6·4	6·8	7·0	0·1	4·3
4	91	41	32	24	10	59	305	140	39·7	8·3	3·8	20·5	13·8	2·0	2·8	0·2	8·9
5	197	98	56	31	48	86	449	203	35·4	11·3	8·7	21·0	13·8	2·3	3·6	0·5	3·4
6	58	37	15	45	40	67	346	183	18·4	19·3	18·4	23·1	3·0	6·4	5·4	0·3	5·7
7	322	94	51	20	44	55	203	187	73·0	8·0	3·7	4·5	2·8	1·2	1·7	0·7	4·4
8	199	83	50	25	23	59	338	173	48·9	10·1	10·7	13·4	6·4	3·3	0·5	0·6	6·1
9	58	47	81	31	15	63	497	169	11·1	17·5	9·8	37·2	11·6	8·8	0·9	0·6	2·5
10	67	71	29	32	19	65	314	141	35·3	13·9	16·4	13·1	4·9	6·1	6·0	0·6	3·7

† Cows, in-calf heifers, and bulls.

‡ Rye is important only in District 2, where it represents 3% of the farmed land.

§ Rough grazings have been allocated in equal proportions to pasture and to waste.

District	Distribution (£) of Gross Income:—									Distribution (£) of Gross Charges:—						
	Dairy produce	Horned stock	Pigs	Poultry and eggs	Sheep and wool	Wheat	Barley	Sugar beet	Other crops	Miscel-laneous	Labour	Food-stuffs	Livestock	Rent	Fertilisers	Seeds	Miscel-laneous
1	162	179	78	94	54	39	106	49	32	17	280	133	160	119	18	24	122
2	79	71	30	14	74	9	33	50	23	18	157	60	57	46	11	12	51
3	95	101	140	75	20	39	57	27	46	12	261	106	89	93	13	12	102
4	133	111	59	25	33	7	44	69	40	13	213	93	94	58	21	14	75
5	299	146	90	135	53	26	48	63	114	27	333	181	111	98	12	24	123
6	64	57	99	86	12	64	52	10	72	15	241	88	53	77	21	16	96
7	395	97	45	108	55	13	5	13	63	17	218	171	93	99	12	10	122
8	382	120	33	55	47	36	3	5	144	50	316	117	98	122	21	26	140
9	92	99	89	23	83	47	181	68	44	18	256	91	137	107	29	27	108
10	53	86	55	39	27	43	14	12	107	14	190	57	46	76	17	18	80

Table IV

SIZE GROUPING (Figures "per farm.")

MISCELLANEOUS EXPENSES IN £ PER FARM

A detailed analysis of the figures given in the last column of Table II

SIZE GROUPING (Figures "per farm.")

Size group (Acres)	Fuel:—					Motor cars and vans:—		Hire of tackle:—		Machinery and implements:—			Small tools, plough-shares, etc.	Harness	Buildings, huts and sheds	Fencing material	Draining material
	Coal	Paraffin	Petrol	Lub. oil	Electricity	Tax and insurance	Repairs and tyres	Threshing	Cultiva-tions	Additional	Replace-ments	Repairs					
20–50	5·6	2·3	1·6	0·4	0·3	2·1	1·2	4·4	2·8	3·1	2·3	3·7	1·9	1·4	5·6	0·6	0·5
50–100	7·3	3·9	4·2	1·0	0·4	5·5	1·8	8·8	1·8	3·4	3·4	7·6	3·4	2·5	5·0	0·5	0·7
100–150	9·5	8·0	6·2	2·3	0·2	7·1	3·9	13·6	3·4	9·2	6·5	12·4	4·1	3·6	7·3	1·2	0·5
150–300	14·7	14·0	11·7	4·0	0·7	12·8	6·2	22·8	8·0	16·5	15·0	20·3	6·4	4·7	10·0	2·6	0·8
300–500	19·7	25·2	19·6	8·0	0·5	20·0	9·3	30·8	15·0	18·5	22·8	35·0	9·8	8·0	15·3	2·6	0·9
Over 500	37·9	56·5	27·4	17·5	2·2	24·2	13·4	43·8	35·4	15·8	69·6	98·6	22·2	14·7	15·1	4·1	1·4

Size group (Acres)	Road and rail carriage	Sack hire	Binder twine	Fire insurance	Telephone	Rates:—		Vet. and medicines	Sprays and dips	Registra-tion and recording	Horse shoeing	Stamps and stationery	Business subscrip-tions	Sundries	Gross expenditure	Deduct for capital expenditure	Net expenditure
						Ordinary	Water										
20–50	4·1	0·1	1·0	1·9	0·3	4·6	0·9	2·1	—	—	2·6	0·6	0·1	—	58·1	5·2	53
50–100	10·0	0·2	2·5	3·2	0·6	6·0	1·1	3·1	0·2	0·1	4·4	1·0	0·3	1·9	95·8	4·4	91
100–150	18·9	0·6	3·7	4·7	1·2	8·5	1·8	3·8	0·4	0·5	5·5	1·3	0·8	0·9	151·6	10·0	142
150–300	22·1	0·6	6·0	6·8	1·8	12·2	1·3	5·3	0·5	0·7	7·5	2·0	1·3	2·3	241·6	18·4	223
300–500	24·3	1·1	10·6	10·4	3·2	17·8	3·3	7·1	1·2	0·6	11·9	2·1	2·0	3·2	359·8	26·2	334
Over 500	83·3	6·0	19·3	22·2	6·7	29·4	3·8	13·4	8·6	2·6	20·1	3·8	2·9	6·1	728·0	15·5	713

Table V

SIZE GROUPING

EQUIPMENT AND MISCELLANEOUS ECONOMIC AND SOCIAL DATA

SIZE GROUPING

Size group (Acres)	Percentage of farms equipped with:—									Distance (miles) to:—		% area owned by occupier	% area requiring draining	% farmers adhering to rotation	% coming from other occupa-tions	% belong-ing to Co-operative Associa-tion*	% keeping financial accounts
	Tractor	Motor van	Motor car	Fixed engine	Threshing machine	Steam engine	Milking machine	Telephone	Electricity	Market	Rail station						
20–50	3	2	11	9	—	—	—	5	2	6·8	2·9	33	15	43	36	7	5
50–100	10	5	18	27	1	—	1	7	3	7·9	2·9	35	17	58	32	9	7
100–150	23	6	21	40	2	1	1	12	3	7·6	3·1	45	15	53	19	6	13
150–300	47	10	51	44	7	1	2	17	7	7·4	3·2	44	15	45	12	15	21
300–500	64	12	67	44	25	5	4	31	4	8·9	3·3	41	15	50	12	20	32
Over 500	78	27	70	57	46	14	3	57	11	8·2	2·8	47	11	49	12	40	73

* Association either for the marketing of produce or the supply of requirements.

WEIGHTS FOR PRICE AND COST INDICES.

THE price and cost indices published in the annual statistics issued by the Ministry of Agriculture cover the most important agricultural commodities and requirements, and refer to conditions throughout the country as a whole. In arriving at a composite index number for all commodities "weights"* are introduced in the official figures to represent the relative importance of each commodity, but obviously a general index cannot be taken as representative of conditions for any particular size of farm or farming district. Cereals, for example, are of greater significance in the eastern counties than elsewhere in England, dairy produce is more important in south than in north Essex; while poultry and eggs have greater weight on small than on large farms.

The figures presented in the following two tables represent the percentage composition of the gross incomes and gross charges of certain size and locality groups of farms in the eastern counties for the year 1931. They illustrate the *relative* importance of the various cash items for the year in question, and can be used as a basis for calculating composite price and cost indices for the different sizes of farms or farming localities. Further, the effect on the different sections of the industry of changes in prices or costs can be estimated from these figures. For example, if the price of milk for 1932 is 14 per cent. below the 1931 level, this drop will reduce (production remaining constant) the average gross incomes of all sizes of farms in the eastern counties by roughly 3 per cent. $\left(\frac{23{\cdot}8 \times 14}{100}.\right)$ It should be noted that this form of calculation makes no allowance for changes in *volume* of production, and where these are of any magnitude, due adjustment must be made.

A. SIZE GROUPS

Size of farm	20–50 acres.	50–100 acres.	100–150 acres.	150–300 acres.	300–500 acres.	Over 500 acres.	All sizes
Commodities :—							
Dairy produce	25·9	30·1	24·8	24·4	18·5	17·3	23·8
Horned stock	11·6	14·6	17·7	17·7	20·8	13·6	16·3
Pigs	17·0	13·2	11·6	9·0	8·5	11·3	11·2
Eggs	12·8	8·7	7·1	6·2	4·7	3·5	7·0
Sheep and wool	1·7	2·5	3·5	6·6	9·5	12·7	6·0
Poultry	7·4	5·6	5·3	3·3	2·5	0·9	4·2
Barley	5·0	7·5	7·1	7·9	9·8	10·5	7·9
Wheat	3·0	3·9	4·1	5·2	7·0	10·0	5·3
Sugar beet	3·4	4·9	4·5	5·0	3·7	7·2	4·7
Potatoes	5·9	2·0	4·3	4·2	3·2	2·7	3·8
Hay	0·6	1·2	1·7	2·2	2·9	2·1	1·9
Oats	0·6	0·6	0·6	0·7	1·1	0·5	0·7
Peas and beans	0·6	0·5	0·6	0·5	0·7	0·5	0·6
Other crops	2·4	2·1	5·1	4·4	4·5	4·7	4·1
Miscellaneous	2·1	2·6	2·0	2·7	2·6	2·5	2·5
Gross income	100·0	100·0	100·0	100·0	100·0	100·0	100·0
Requirements :—							
Labour	28·3	33·8	36·2	36·8	36·7	40·4	35·7
Feeding stuffs	26·9	18·4	17·3	15·7	12·4	12·5	16·7
Livestock	12·5	14·4	13·3	13·8	16·4	11·2	13·7
Rent	14·0	14·3	13·6	13·4	13·8	11·9	13·5
Seeds	2·6	2·8	2·9	2·7	2·9	2·7	2·8
Fertilisers	1·9	2·2	2·4	2·8	3·3	4·4	2·8
Miscellaneous	13·8	14·1	14·3	14·8	14·5	16·9	14·8
Gross charges	100·0	100·0	100·0	100·0	100·0	100·0	100·0

* These weights have not been revised since 1908, since when the relative importance of certain types of produce has altered materially.

B. LOCALITY GROUPS

[redacted] No.*	1	2	3	4	5	6	7	8	9	10
Commodities :—										
Dairy produce	20·0	19·6	15·5	24·9	29·9	12·0	48·7	43·6	12·4	11·8
Horned stock	22·1	17·8	16·5	20·8	14·6	10·7	12·0	13·8	13·3	19·0
Pigs	9·7	7·5	22·9	11·0	9·0	18·7	5·5	3·8	11·9	12·3
Eggs	4·1	2·2	10·0	2·9	9·2	10·5	9·5	4·1	2·4	6·5
Sheep and wool	6·7	18·5	3·2	6·2	5·3	2·3	6·8	5·3	11·0	6·0
Poultry ..	7·5	1·2	2·2	1·7	4·3	5·7	3·9	2·2	0·7	2·1
Barley	13·1	8·3	9·4	8·3	4·8	9·9	0·6	0·4	24·4	3·1
Wheat	4·8	2·2	6·4	1·3	2·6	12·0	1·6	4·1	6·3	9·5
Sugar beet ..	6·1	12·5	4·4	13·0	6·3	1·8	1·6	0·5	9·2	2·7
Potatoes ..	0·3	0·2	0·2	4·1	4·9	0·7	3·3	8·9	0·4	6·3
Hay	0·9	0·4	1·2	0·3	0·4	4·6	1·8	3·2	2·1	4·3
Oats	0·7	1·5	0·3	2·2	0·8	0·6	—	0·7	1·1	0·6
Peas and beans	0·1	0·2	1·1	0·2	0·4	1·1	0·2	0·1	0·2	2·5
Other crops ..	1·8	3·4	4·7	0·7	4·8	6·6	2·4	3·6	2·1	10·2
Miscellaneous ..	2·1	4·5	2·0	2·4	2·7	2·8	2·1	5·7	2·5	3·1
Gross income ..	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
Requirements :—										
Labour ..	32·7	40·0	38·6	37·5	37·7	40·7	30·1	37·6	33·9	39·3
Feeding stuffs ..	15·6	15·2	15·8	16·4	20·5	14·8	23·6	13·9	12·1	11·7
Livestock ..	18·7	14·4	13·2	16·5	12·6	9·0	12·8	11·6	18·1	9·6
Rent	13·8	11·6	13·7	10·2	11·1	13·0	13·6	14·5	14·1	15·7
Seeds	2·8	3·2	1·7	2·5	2·7	2·7	1·5	3·2	3·6	3·7
Fertilisers ..	2·2	2·7	1·9	3·7	1·4	3·6	1·6	2·5	3·9	3·5
Miscellaneous ..	14·2	12·9	15·1	13·2	14·0	16·2	16·8	16·7	14·3	16·5
Gross charges ..	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

* *Code to district numbers :—*

1. Central Norfolk light loam.
2. Norfolk breck.
3. Central Suffolk heavy loam.
4. North-east Suffolk sand and gravel.
5. South-east Suffolk and north-east Essex sand and gravel.
6. North Essex and south-west Suffolk boulder clay.
7. South Essex london clay.
8. South Hertfordshire gravel.
9. South Cambridgeshire gravel.
10. Huntingdon and west Cambs. clay.

PRINTED BY
W. HEFFER & SONS LTD.,
CAMBRIDGE, ENGLAND.