Report to the Carnegie United Kingdom Trust
from the Rowett Research Institute

Family Diet and Health
in
Pre-War Britain

A DIETARY AND CLINICAL SURVEY

Carnegie United Kingdom Trust
COMELY PARK HOUSE, DUNFERMLINE, FIFE
SCOTLAND

1955

FAMILY DIET AND HEALTH IN PRE-WAR BRITAIN

ROWETT RESEARCH INSTITUTE

(in 1955)

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PREFACE BY LORD WOOLTON

INTRODUCTION BY LORD BOYD ORR

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CONTENTS

	PAGE
PREFACE BY THE RT. HON. LORD WOOLTON, P.C., C.H.	7
INTRODUCTION BY THE RT. HON. LORD BOYD ORR, F.R.S.	9
ACKNOWLEDGMENTS	13
PERSONNEL OF THE SURVEY	15
I. *The Diet of the Population*	17
A. Methods of investigation	17
B. Population	24
C. Cost of food	28
D. Foodstuffs	29
E. Nutrients	41
F. Repeat surveys	47
II. *The Growth and Health of the Child Population*	50
A. The Clinical survey	50
B. The Feeding experiment	58
III. *The Survey in Retrospect*	63
Summary	64
References	66
Appendix 1. Dietary standards as criteria of deficiency, by A. M. Thomson	67
Appendix 2. Extracts from " Technique and Interpretation of Dietary Surveys ", I. Leitch and F. C. Aitken, 1950, *Nutrition Abstracts and Reviews*, Vol. 19	75
Appendix 3. Tables with index	78
Appendix 4. Figures with index	156

PREFACE

BY LORD WOOLTON, P.C., C.H.

THIS is a unique record ; unique, because it profoundly affected the life of a nation during a world conflagration but is only now, ten years later, being published.

During the war I was charged with the task of feeding a nation largely dependent on overseas supplies of food which it was the interest and the determination of the enemy to sink at sea or to bomb on land. Through his efforts, and our own austerity, our consumption of imported food fell by two-thirds.

Faced with this threat to our survival, I decided to try to develop a food policy based on the scientific knowledge of those engaged in the study of nutrition and biochemistry, translated in terms of a dietary restricted by war-time conditions of supply.

Many of the conclusions of this report were placed at my disposal. Lord Boyd Orr had already paved the way by arousing public opinion as to the danger to the well-being of a nation when considerable numbers of the population suffer from under-feeding. He investigated deficiencies in diet due to poverty and, in the work outlined in this remarkable report, had proved by clinical examination what had previously been left to empirical observation.

The nation, already alarmed about the consequences of under-feeding due to poverty, was faced, at the outbreak of war, with the danger of the entire population suffering in a similar manner, not from poverty, but from inevitable shortage.

Something of the correlation between health and diet was beginning to be understood. The situation constituted a challenge to scientific knowledge, to administrative capacity and to political courage and above all, perhaps, to the faith and endurance of the people.

This report shows how patiently physical and medical scientists had worked on the problem between the years 1920 and 1939 ; they placed the nation in their debt, and their reward lies in the help they gave to their country in its time of direst need and perplexity.

It would be false to assume from the records of this work that dietary deficiency arises exclusively from economic causes. Ignorance is as great a danger as poverty ; these may exist separately or together—and ignorance may persist the longer.

The stringency and the stress of war made it necessary to deal with both these problems. People began to give as much thought to the consideration of food as a human fuel as the skilled engineer affords to the feeding of his engines ; because of this it became possible to persuade the public that, with the use of the knowledge at our disposal, and with some sacrifice by the adult population, it was possible to secure not only that our children should not suffer from the privations of war, but that we might even rear a generation healthier and sturdier than its forbears.

This was done. Mothers in pregnancy were taught the proper use of foods and given some elementary idea of the use of vitamins and of the nature

of the protective foods. Milk as a food for growing children came into its own, and the school meals service—in which, if local authorities were wise, the knowledge of the dietitian was brought into service—completed the task of establishing in the young the foundation of a stamina that would lead to a healthy maturity.

That, in my opinion, was the highest service rendered in war-time by those charged with the feeding of the nation. What was started then, and what the public learned then, will endure. The light of science has shown the way to national health and the knowledge will endure from generation to generation.

I have described this achievement because so much of it owed both inspiration and knowledge to the work recounted in the pages that follow : with deep and abiding gratitude I acknowledge my obligation to Lord Boyd Orr and to all his colleagues who were engaged in the work.

INTRODUCTION

By Lord Boyd Orr, F.R.S.

The investigation recorded here originated in the widespread interest in both the economic and the health aspects of food which was aroused by the course of events between the two world wars. In the 1920s food production exceeded economic demand. Unmarketable surpluses accumulated and prices fell below the average cost of production with the result that many farmers went bankrupt and land went out of cultivation. To halt the agricultural depression this and certain other countries took measures to limit the production and import of food as a means of raising prices. At the same time research in Nutrition was demonstrating that some prevalent disease like rickets and much indefinite ill health were due to deficiencies of vitamins and other essential constituents in the diet. In 1926-27 an experiment with 1,500 children done by the Rowett Institute showed that the addition of milk made a definite improvement in rate of growth and health in ordinary children not suffering from any obvious disease. A dietary survey of the families of the children showed that the milk made good deficiencies in their home diet which was worst in the poorest homes. At that time there was a good deal of unemployment and the "glut" of the more expensive foods needed for health such as animal products, fruit and vegetables, was largely due to decreased purchasing power.

There were thus two conflicting interests: one demanding less food and a high price in the interest of the farmer, the other demanding more food at a price within the purchasing power of the poorest in the interest of health. Dr. Walter Elliot who had done research at the Rowett Institute and was then Minister of Agriculture, had helped to promote the test with school children. He expressed the view that the glut of food was due not so much to overproduction as to underconsumption, and Mr. Stanley Baldwin, then Prime Minister, said the two evils—too much food bringing ruin to farmers and too little food causing ill health among the poor—should be made to cancel each other out. Measures such as cheap or free milk to mothers and children and raising the allowance for the children of the unemployed were therefore taken to help to bring a diet adequate for health within the purchasing power of the poorest families. In the United States somewhat similar measures, especially the food stamp plan, and agricultural support prices were adopted.

In 1933 the Market Supply Committee with the late Marquis of Linlithgow as chairman was set up to advise the Government on the amount of different foods which should be allowed to be imported: it seemed desirable to ascertain how much of the different foods were consumed at different income levels and whether and to what extent the national food supply and distribution were such as to enable everyone to get a diet on the health standard.

With the approval of the Minister of Agriculture and the support of the Empire Marketing Board the staffs of the Rowett Institute and the Market Supply Committee brought together all the available information. The

Report showed that more than a third of the population (the poorest third) did not enjoy a diet on the health standard and the main cause was inadequate purchasing power. This led to further measures to improve the nation's dietary.

The whole question of the national food supply in relation to economics and health was obviously of such importance that a further, and more extensive, enquiry was called for. The Trustees of the Carnegie Trust became interested and made a special grant of £15,000 to the Rowett Institute to carry out an investigation which would involve not only a study of the food eaten and its nutritive value in families with children but which would include also first an assessment by clinical methods of the health of the children in these families and later a study of the effects, measured by these same clinical methods, of making such changes in their diets as the dietary survey had shown to be desirable. To this end more than thirteen hundred households with nearly eight thousand persons distributed over sixteen different districts in Britain, which had been selected as representative of the economic conditions prevailing at the time, were chosen for study. The analysis of the data was in progress at the outbreak of war. The results were asked for and submitted to the Ministries concerned and according to a statement after the war made by Lord Woolton, the data on food consumption at different income levels and other information supplied was of great value in evolving the war food policy based on nutritional needs with special measures to safeguard the health of mothers and children.

Apart from the preparation of that interim report, all work on the investigation had stopped with the outbreak of war. Other than those who joined the Services practically all the temporary staff for the investigation were taken over by the Ministry of Food. Mr. Lubbock, under whose leadership the Diet Survey Team had worked, went to Washington to F.A.O. on his release from the Services. Dr. Cuthbertson, the new Director of the Rowett Institute, decided that the work of analysing the data collected—a long and tedious job—should be undertaken and a Report drawn up and submitted to the Carnegie Trustees who had provided the funds for the investigation.

The Report is mainly of historic interest. It gives a picture of the state of nutrition in this country in the period just prior to the Second World War. It shows the great advance which had been made in the application of the science of nutrition between the two world wars. The milk test with Scottish school children in 1926 was the first of a series that terminated in 1936. The last of these showed a decreased effect of supplementing the home diet with milk, an indication of improvement in the nutritional state of the children. In this investigation, made in 1938, the provision of extra food for the children still had an effect in increasing their rate of growth.

In some respects this Report records the results of the vigorous movement from the early 1920s until 1939 to get the new knowledge of nutrition applied to the improvement of the health and physique of the people, a movement which culminated in the war food policy based on nutritional needs of different classes and which was so efficiently administered by Lord Woolton, the Minister of Food, that, in spite of the acute food shortages, the women and children of the poorer classes were healthier at the end of the war than at the beginning of it. This is an achievement in which the nation can take pride. It gave a lead to the whole world in promoting welfare by better feeding.

It may be of interest to refer to the " nutrition campaign " to get a diet adequate for health within the reach of the poorest. It was carried on by scientists like the late Sir Frederick Gowland Hopkins and many others who are still alive, by some of the leading medical men like Lord Horder, by M.P.s of all parties led by the late Eleanor Rathbone, by others such as Mr. le Gros Clark who by acting as secretary to committees and by his own writings has helped to create a well informed public opinion on the subject. It is pleasing to record that when the Ministers of the Crown concerned with food and agriculture had the facts of the food situation put before them they promoted measures to eliminate malnutrition.

The result of this movement was seen during the war when a well informed public opinion approved and helped to get carried into effect a rationing system which gave priority for milk and eggs to mothers and children and ensured that when a cargo of oranges came in, a millionaire could not get one until the poorest child in the slums had got sufficient for its needs.

The investigation recorded forms an important part of this national movement for improved nutrition which had such a beneficial effect on national health. It is interesting to note that the dietary survey which formed the fundamental part of the investigation has been continued by the Ministry of Food's National Food Survey Committee. It is to be hoped that the Government will continue to base its agricultural and food import measures on the nutritional needs of the people as did Lord Woolton's policy during the war.

ACKNOWLEDGMENTS

ACKNOWLEDGMENT of the help provided by the many from whom it came so liberally when wanted is, in an investigation of this magnitude, a difficult task. By providing the money without which the work could not have been done the Carnegie United Kingdom Trust demonstrated again its care for the welfare of the people of Britain. In its turn that part of the British population which was selected for study responded generously in supplying the information which was sought. The examination of the children in the schools required, for the actual collection of the data, the co-operation of the scholars themselves, of their teachers, medical officers and catering staffs and, for the making of the necessary arrangements, the aid of the Directors of Education and Medical Officers of Health in the several districts. The supply of the food for the feeding experiment was, in many instances, facilitated by the manufacturers and distributors and the vitamin capsules were a gift from Messrs. Crookes Laboratories Ltd.

The extent of the co-operation among individuals, Government Departments and commercial organisations was probably realised to the full only by those working at the Rowett Institute where the Survey was centred and the best tribute to it and to all who gave it is to be found in the mass of data which formed the basis of this report.

PERSONNEL OF THE SURVEY

The Survey was planned by Sir John, now Lord Boyd Orr.

The Diet Survey Team was under Mr. David M. Lubbock, whose general direction of it was given voluntarily and generously. In the field it was supervised by Miss Isabel Dods and it included

Miss J. Barker
Miss M. Boneske
Miss I. Buchanan
Miss B. Campbell
Miss R. Campbell
Miss R. Canney
Miss P. Evans
Miss M. Herring
Miss M. McCready
Miss F. Russell
Miss G. Warnock

The Clinical Survey Team consisted of

Dr. J. Pemberton, now of the Department of Social Medicine, University of Sheffield, and

Dr. A. M. Thomson, now of the Midwifery Department, University of Aberdeen.

They were assisted by Mr. J. R. K. Pirie and Mrs. Pemberton.

The computors were stationed at the Rowett Research Institute.

Analyses of foodstuffs were made, under the direction of Mr. William Godden, in the Biochemistry Department of the Rowett Research Institute and the estimations of haemoglobin were done by Dr. John Duckworth, a member of the Staff of that Department.

Dr. Isabella Leitch of the Commonwealth (formerly Imperial) Bureau of Animal Nutrition and Mr. William Godden were associated with Lord Boyd Orr in the planning of the Survey and gave assistance and advice on the interpretation and presentation of the findings.

Help in connection with statistical analyses was given by Mr. M. H. Quenouille of Aberdeen University and by Mr. A. W. Boyne of the Rowett Research Institute. The graphs were drawn by Mr. P. C. Jowsey of the Commonwealth Bureau of Animal Nutrition.

This report was prepared by Dr. D. Harvey, now of the Commonwealth Bureau of Animal Nutrition.

I. THE DIET OF THE POPULATION

A. METHODS OF INVESTIGATION

1. Regions

THE Survey was planned on a nation-wide basis and the following are brief descriptions of the sixteen areas where the families were resident:

SCOTLAND

(i) *Aberdeen.* An urban area in which households from all levels of the city's population were taken.

(ii) *Kintore.* A small Aberdeenshire country town from which only a few households were chosen.

(iii) *Hopeman.* A Morayshire fishing village which provided households almost all of which were dependent upon that industry.

(iv) *Barthol Chapel;* (v) *Methlick;* (vi) *Tarves.* Three adjacent Aberdeenshire rural parishes from which a population consisting almost entirely of farmers and farm workers was selected.

(vii) *West Wemyss;* (viii) *Coaltown of Wemyss.* Two districts of the Fife coalfield which provided households mostly connected with the Scottish mining industry.

(ix) *Dundee.* An urban area which gave a population engaged in a variety of occupations, with many millworkers unemployed because of the depression in the jute industry.

(x) *Edinburgh.* The families were from a poor area and many of the men were unemployed.

ENGLAND

(xi) *Barrow-in-Furness.* An industrial area which gave households whose workers were employed mainly in the ship-building yards and steel works but among whom unemployment was common.

(xii) *Liverpool.* An industrial area and seaport where many of the households selected were ones in which the male wage earner was out of work.

(xiii) *Yorkshire: West Riding.* A district which provided families mainly connected with the coal-mining industry and thus comparable with the Wemyss district in Scotland.

(xiv) *Wisbech.* A rural fruit-growing centre in the Isle of Ely with families chosen mainly from villages and small-holdings.

(xv) *Fulham.* A middle-class district of London providing families the males of which followed urban occupations.

(xvi) *Bethnal Green.* A poorer area of London: the households chosen included many with unemployed men.

In addition, surveys were made in Gordonstoun School, Morayshire, and in Aberlour Orphanage on Speyside; data from these are not included in this report.

2. Recording of data

For each household included in the Survey there was provided a notebook which bore the name of the family, the home address, and a reference number. In it the recorder entered, in tabular form, details of the family food supply during the survey week, and other necessary information. The tables completed were as follows:

Table 1. Details of the household members by name, reference number, age, sex, and occupation, followed by a brief summary of the general state of health of the family. Starting and finishing dates of the survey. Surveys lasted one week, usually from pay-day to pay-day.

Table 2. Information was requested about family income. The response, however, was poor.

Table 3. Absence of any member of the household from any meal provided in the home during the study week and of the presence of any visitors who had shared these meals.

Table 4. Notes on the amount and type of food waste. Brief descriptions of the menus provided a check on the foodstuffs reported as having been used.

Table 5. Most of the notebook was taken up by this table. A quantitative inventory was made of all the food on hand at the start of the Survey. Every purchase or acquisition of any foodstuff during the survey week was recorded. The price per unit and the total cost of each food purchase were entered. At the end of the week another inventory of all the food in the home was made. From these entries the amount and cost of every foodstuff used during the week was calculated.

Table 6. This was intended for a statement of the family's income and other expenses but was completed in only a few cases.

Table 7. A statement of the type of dwelling, its rent, and the state of domestic cleanliness. The standard of the care of the children was also noted.

Table 8. Some notes on the cooking and preparation of the food, and on meal times. The recorder also gave her opinion of the sense of thriftiness in the home and of the housewife's efficiency as its manager.

These eight tables included all the data regarding the composition of the household and the amount and cost of the food in the home diet. There were in addition two important sources of food which had to be considered. School meals and milk schemes allowed children to obtain extra food, either free or at a reduced cost; there were also, at clinics throughout the country, opportunities for mothers to get either for themselves or for their children, milk and other special foods. For most families these two schemes were

likely to be the only sources of outside meals. The expenditure on these and the amounts of food so obtained were recorded. The former is referred to below in connection with the three bases of costing which were used but for two main reasons, the contribution of school and welfare foods to the diet is not dealt with in this report. First, it was impossible to ascertain the composition of school meals or the amounts eaten. Second, the number of families affected and the extent to which these potential sources of food were used varied greatly with social class and within social classes. To spread an assessed supply of foods or nutrients taken by particular families over a whole group of families would not have given a true picture of the use or effect of these foods, and, so far, a separate analysis for the families taking the extra foods, which, strictly speaking, could be only descriptive, has not been attempted.

3. Costing of food and grouping of households

With the system of recording described three bases of costing were used:

Basis 1. This was the actual sum of money spent on food coming into the home to which was added the retail value of food obtained from gardens and allotments or as a perquisite from an employer. This basis was the initial amount used for the two other systems of costing.

Basis 2. This was the expenditure on food consumed in the home and in school. It included at their actual cost supplies which came from the welfare schemes mentioned but did not include the cost of canteen and such meals other than school meals eaten away from home. This basis was selected as the best measure of the family's capacity to purchase food and was used for the classification of the families according to food expenditure.

Basis 3. This was similar to the second basis but the real value at retail level of welfare foods was substituted for the actual cost to households. Expenditure on outside meals, other than those in school, was again ignored.

The quantities of the foodstuffs and their costs having been obtained it became necessary to reduce them to a form in which comparisons would be made between groups of households. It seemed clear that some system of calculating the quantities and costs per head would be best but the mode of computation of the number of " heads " in a household had not been satisfactorily agreed. An analysis of techniques, based largely on the discussions which took place in connection with this Survey, was made by Leitch and Aitken (1950) and the parts relevant to the " per heading " procedure in this analysis are quoted in Appendix 2.

Briefly, it was decided that the number of heads should be taken simply as the number of individuals irrespective of age, occupation, and pregnancy or lactation. The justification for this is set out in the quotations just cited.

With so large a survey it was impossible for the ideal to be attained of having all of the members of each household present at every meal and without visitors to share the food. To cover the complications arising from the presence of visitors it was assumed that preparations had been made in advance for their coming and that the amount of food purchased had, for that reason, been increased. It was, therefore, decided that an allowance

should be made for their presence and, by an assessment of the habitual distribution of the food over the day's meals which was made by the investigator, a fraction was added to the number of consuming heads to make allowance for these visitors.

No similar allowance was made for meals taken outside. The original intention was to make an allowance for outside meals, and three methods were possible: first, to add food to the household consumption on the basis that outside meals were equivalent to similar meals taken at home; second, to reduce the family requirements by the same amount; or third, to adjust the per heading procedure by deducting a fraction for each outside meal consumed by a member of the household. All these procedures involve the assumption of equivalence between outside meals and meals consumed in the house. There is no basis for making such an assumption and it was thought to be less misleading to deal only with the foods actually measured. (See Appendix 2.)

When the amount of money spent per head had been calculated on the *second* basis of costing, the households were arranged in groups on the following system :

Group	*Food expenditure per head per week*
I	up to 2s. 11¾d.
II	3s. to 4s. 11¾d.
III	5s. to 6s. 11¾d.
IV	7s. to 8s. 11¾d.
V	9s. to 10s. 11¾d.
VI	over 11s.

It was on the data for the households, grouped according to this system, that all subsequent work was done and all additional calculations were made.

4. Checking of data and repeat surveys

In an investigation of this type the need for checking the data is generally recognised. During the actual survey of each household the investigators' records of menus allowed comparison of the dishes with the foodstuffs which were available for their preparation. In addition some more intensive examinations were made in certain of the homes and, in the fourth table of the notebooks, weights of waste which accumulated from day to day were entered. Not only were packages such as paper containers and bottles weighed in order to provide an accurate measure of their contents but, in these intensive surveys, waste from the table and plates was also weighed. The findings in this connection are summarised in Section E (3) (p. 45).

In order to check the reproducibility of the results which had been obtained by the survey method duplicate investigations of some households were undertaken after an interval which varied from centre to centre. These repeat surveys were made at eight of the Scottish and at three of the English centres and the number of households so treated was 361, approximately one in four of those originally examined. In addition to providing checks of the original surveys these repeat investigations were deemed likely to provide information on seasonal changes, if any, in the foods and nutrients available at the centres where they were made. When the comparison with the corresponding original surveys was made, however, it was found, as was to be

expected after the lapse of anything from three to fifteen months, that changes in family composition had taken place. These changes resulted, in some cases, in the movement of the household from one expenditure group to another but the number of such movements was insufficient greatly to affect the comparison. The findings for these repeat surveys are considered in Section F (p. 47); their dates, with those of the original surveys, are given in Table 1.*

5. Analysis of data

Average food expenditure for each group, assembled on their Basis 2 expenditure, were computed also on Bases 1 and 3. The difference between Basis 2 and Basis 1 gave a measure of the average cost to households of foods supplied under the welfare schemes and the difference between Basis 3 and Basis 1 an estimate of the actual value of these foods. These costs are considered in Section C (p. 28).

Foodstuffs were classified in thirty-four sub-divisions of eight main classes and were tabulated in this way for each household.

I. *Milk and Milk Products*

(1) Whole milk; (2) Skimmed and buttermilk ; (3) Condensed milk; (4) Dried milk; (5) Cream; (6) Butter; (7) Cheese.

II. *Eggs*

(8) Eggs.

III. *Meat, Smoked Pig Meat and Fish*

(9) Meat, including fresh pork and poultry; (10) Smoked pig meat; (11) Fish.

IV. *Animal and Vegetable Fats*

(12) Animal fats; (13) Vegetable fats.

V. *Vegetables*

(14) Potatoes; (15) Other tuber and root vegetables; (16) Green vegetables; (17) Dried vegetables; (18) Canned vegetables; (19) Other vegetables.

VI. *Fruit*

(20) Fresh fruit; (21) Canned fruit; (22) Dried fruit.

VII. *Cereals and Cereal Products*

(23) Wheat flour; (24) White bread; (25) Brown bread; (26) Rolls, buns and scones; (27) Biscuits; (28) Cake; (29) Oatmeal and oatcakes; (30) Other farinaceous foods.

VIII. *Sugar and Beverages*

(31) Sugar; (32) Syrup and treacle; (33) Jams and marmalade ; (34) Chocolate, cocoa and other beverages.

From these tabulations the quantities available for the groups as a whole were computed and the amounts consumed per head per week were calculated for each expenditure group. This is dealt with in Section D (p. 29).

* Tables designated by figures are those in Appendix 3.

The nutritive value of the foods consumed was calculated, for each district and expenditure group, from a specially prepared table of food composition derived from the best information available in the literature at the time and supplemented by the results of analyses specially undertaken at the Rowett Research Institute. Values were based on the edible portion of each food as purchased and no allowance was made for losses in preparation and cooking. The values calculated were:

(1) Energy value
(2) Animal protein
(3) Total protein
(4) Carbohydrate
(5) Fat
(6) Calcium
(7) Phosphorus
(8) Iron, total and " available "
(9) Vitamin A
(10) Vitamin B_1
(11) Vitamin C

The following notes explain some of the procedures adopted:

Calories. The conversion factors 4·1, 4·1, and 9·3 were used per g. of protein, carbohydrate and fat, respectively.

Iron. Total and " available " iron were computed but no use has been made of the estimates of " available " iron since the significance of that fraction appeared more than doubtful.

Vitamin A. The values used were all biological, most of them from a table prepared by Fridericia and included in the textbook of Faber and Norgaard (1934). No account had to be taken of preformed vitamin A and carotene and no correction was required.

Vitamin B_1. Cowgill's values (1934) for the vitamin B_1 content of foods in " mg. equivalents " were converted to international units (20 = 1 I.U.) and used with the rat bradycardia values of Baker and Wright (1935). The estimate of requirements also was based on the arguments of these workers, Cowgill (1934) and Baker and Wright (1936). For this report the figures for supplies have been reconverted to mg. of the pure vitamin (333 I.U. = 1 mg.).

Vitamin C. Most of the data came from Fridericia's table.

For each of the vitamins data were added to the original list as the need arose and as values were published. For instance the vitamin B_1 contribution from oatmeal was adjusted at a relatively late date.

6. Assessment of requirements

By the methods described so far, estimates of expenditure on food, average consumption levels, and average intakes of energy and nutrients were obtained, usually on a per head per day or week basis. The next problem was to determine the nutritional needs of the populations concerned and to compare actual intakes with requirements.

When the Survey began pronouncements on human nutritional requirements, such as those of the League of Nations, were under critical examination at the Rowett Institute and the Imperial Bureau of Animal Nutrition, and *ad hoc* reviews of current experimental findings were prepared. From the best information available up to 1937, a table of requirements was prepared for use with Survey data. These Rowett Institute standards are reproduced in Table A.*

* Tables identified by letters are those in the text.

In addition to the figures for calories, protein and calcium which are shown, the vitamin B_1 requirement was obtained in international units by taking one-fifth of the number of Calories required. In this report, vitamin B_1 values are converted to units of weight.

At the time when the estimates of requirements were first needed as working tools there was no accepted standard allowance of either vitamin A or vitamin C. Speculations about vitamin A rested too heavily on early work on dark adaptation in man and on the prevention of infection. There was no evidence on which to base a distinction between children and adults although

TABLE A

ROWETT INSTITUTE STANDARD DAILY ALLOWANCES FOR CALORIES, PROTEIN, AND CALCIUM

	Males			*Females*			
	Calories	*Protein g.*	*Calcium g.*		*Calories*	*Protein g.*	*Calcium g.*
Adults				*Adults*			
Unemployed	2,300	70	0·55	Housewives:			
Light work	2,700	70	0·55	Light work	2,200	70	0·55
Medium work	3,400	70	0·55	Medium work	2,600	70	0·55
Heavy work	4,300	70	0·55	Heavy work	3,000	70	0·55
				Pregnant and Lactating	3,300	115	2·0
Children				*Children*			
Age—years				*Age—years*			
Under 1	850	35	0·8	Under 1	850	35	0·8
1	1,050	38	0·8	1	1,020	37	0·8
2	1,200	49	0·9	2	1,150	47	0·9
3	1,350	55	0·9	3	1,250	54	0·9
4	1,450	57	0·9	4	1,350	56	0·9
5	1,550	58	0·9	5	1,450	58	0·9
6	1,650	59	0·9	6	1,600	59	0·9
7	1,820	59	0·9	7	1,750	59	0·9
8	2,000	60	0·9	8	1,900	60	0·9
9	2,200	66	1·0	9	2,100	65	1·0
10	2,400	73	1·3	10	2,350	71	1·3
11	2,600	78	1·4	11	2,700	79	1·4
12	2,900	85	1·4	12	3,050	89	1·4
13	3,200	100	1·5	13	3,250	106	1·5
14	3,650	110	1·5	14	3,300	117	1·5
15	3,950	125	1·9	15	3,200	125	1·9
16	4,000	136	1·8	16	3,100	127	1·8
17	3,850	115	1·2	17	3,000	105	1·2

work on growth of laboratory animals did suggest that the needs of children might exceed those of adults. The idea of including a " margin of safety " in all requirements was, at that time, also generally accepted. This idea and the theory that optimum standards might be judged by reference to the diets of the " best fed " populations both tended to raise the estimate. An assessment of the vitamin A content of the League of Nations diets (1936), which was bound to be only rough, supported a tentative estimate of 4,000 I.U. daily per head of the population and the review by Booher (1938) in the American Medical Association Symposium did nothing to suggest that such an allowance would be too high. At the time too there was no definition of whether this allowance was in terms of a mixed diet or of vitamin A but

because of its close dependence on estimates for the League of Nations diets it had to be regarded as a mixed diet allowance.

For vitamin C the indications at the time were that to maintain saturation in the adult between 50 and 63 mg. were required and that to keep the concentration in breast milk at a minimum level of 4 mg. per 100 ml. a lactating woman should have at least 50 mg. in her diet. These estimates were in good agreement with those given by Smith (1938) from her very complete review of the literature. To allow for losses in preparation and cooking of foods it was decided to take the requirement of vitamin C to be 75 mg. per head of the population.

The requirements of the total population in each area and food expenditure group were calculated by breaking down the " heads " into the categories distinguished in Table A, and calculating the total requirements for each. By dividing the totals obtained by the number of heads average requirements per head per day were obtained and could be compared directly with actual intakes.

In drawing up the table of requirements the needs of children were assessed on a uniform basis irrespective of known differences in body size with social class and those of the unemployed man as sufficient for an average man in health but in idleness. If the degrees of deficit in the poorer families appear large it should be remembered that they are confirmed by the facts that at the time of the Survey, men who had long been unemployed required rehabilitation for work and the children of the poor were smaller, slower growing and lighter for their height than the average, as is in fact shown by the clinical survey (p. 52).

In 1947, a special committee was set up by the British Medical Association " to examine the whole question of nutrition in this country and prepare an authoritative report with particular reference to the adequacy or inadequacy of the wartime and post-war diet ". Its report appeared in 1950, and included a table of recommended allowances (Table 1(c) of the Report), of which it was stated that " the calorie estimates and quantities of nutrients recommended are believed to be sufficient to establish and maintain a good nutritional state in representative individuals of the groups concerned ". It is of interest to consider the Survey data in the light of these more recent estimates, and the necessary recalculation of requirements on the B.M.A. Report basis has been made.

Section E (p. 41) of this report discusses the main technical difficulties and procedures and gives the results of comparisons between needs and intakes on these two bases.

B. POPULATION

The households which were surveyed were deliberately chosen as having children since the aims of the Survey included an examination of the child population. There were, in fact, only four households of childless couples in the total of 1,352 families surveyed. This selection is reflected in the difference between the number of persons per family, 5·9, in this Survey and those in other surveys which have since been conducted by the Ministry of Labour and the National Food Survey Committee where the number was of the order of 3·8.

In 1937 methods of sampling in social surveys had not attained any great degree of refinement and rule-of-thumb selection procedures rather than

elaborate statistical sampling methods were used. In the first place certain districts were chosen to be generally representative of urban and rural areas and of particular industrial and social conditions. In each district the aim was to survey all the families whose children were attending certain schools. These schools were chosen on the advice of the Medical Officer of Health concerned. The majority contained working-class pupils among whom malnutrition seemed likely to exist but in each district an attempt was made to find well-to-do families for comparison. Contact with the individual families was made by the recorders who aimed at obtaining complete co-operation from all families in a given group based on the school. Refusals of co-operation were, in fact, rare.

The main difficulty with such a rough and ready method of sampling is that it is impossible to define in precise statistical terms what the surveyed families represented and, because of this, comparisons with subsequent surveys became difficult. In general terms there is no doubt that the Survey provided a sample, which was reasonably adequate, of working-class families with children. Overall means, however, were weighted on the side of poverty; both middle- and upper-class families were under-represented.

Data regarding the population are given in Tables 2 to 6. In Table 2 the distribution is shown in terms of adults, adolescents and children and in Table 3 the proportions of these have been calculated for the districts. While there is considerable variation from district to district in the composition of the Scottish families and a smaller range for the English the overall figure for the two countries are similar.

Tables 5 and 6 classify the population surveyed by food expenditure group; and some of the effects of this type of classification should be appreciated.

Two methods of economic classification of families are possible: by family income and by income per head. The former method would collect in one group all families within a limited range of income regardless of the number of persons in the family. In the present context, however, we are more interested in purchasing power in relation to the needs of the family than in total purchasing power. As the size of a family increases, its purchasing power per head declines unless income rises *pari passu*, which is altogether exceptional. Income per head is therefore the better measure of purchasing power in relation to needs. Yet to adopt this form of classification automatically causes the larger families to be placed lower in the economic scale than smaller families with similar incomes. Larger families usually contain a larger proportion of children. Therefore, families placed low on an income per head scale will contain more children and fewer adults than those higher in the scale.

In the Survey income per head could not be ascertained and food expenditure per head was used instead. The same sorting out of larger families with more children into the lower food expenditure group occurs. This is of some importance in relation to data in Section D on food consumption per head. The " heads " in the lower expenditure groups contain a greater proportion of children than those in the higher groups, and since children eat less than adults, the average consumption figures in the lower groups will be relatively less than in the higher. To take a simplified and hypothetical example, a Group I family may consist of four children each consuming 2 lb. potatoes per week, and two adults consuming 3 lb.: total 14 lb. potatoes consumed by six individuals, average 2·3 lb. per week.

A Group VI family consisting of two children and two adults consuming similar amounts of potatoes will give a total of 10 lb. consumed by four individuals, average 2·5 lb. per week. In this example consumption levels are identical and the difference, 0·2 lb. per head per week, is artificial. If each member of the wealthier family were to eat twice as much potato, the difference per head per week would be 2·7 lb., of which only 0·2 lb. would be due to the distortion. The method of per heading used in the Survey, therefore, does not produce artefacts of any great significance.

Table B gives the average family composition in each expenditure group, for Scotland and for England separately. The larger number of children in practically all expenditure groups in Scotland will be noted ; also the rising number of adults per family in Scotland as food expenditure increases. The latter trend is less definite in the English data, and its explanation for Scotland is not clear.

TABLE B

AVERAGE NUMBER OF ADULTS AND CHILDREN PER FAMILY

Expenditure group	*Families*	*Adults—per family*		*Children—per family*		
		Males	*Females*	*Males*	*Females*	*Total*
Scotland						
I	12	1·00	0·92	3·08	3·25	6·33
II	170	1·06	0·91	2·40	2·48	4·88
III	146	1·06	1·08	1·85	1·62	3·47
IV	84	1·37	1·21	1·15	1·37	2·52
V	49	1·41	1·37	1·31	0·77	2·08
VI	34	1·38	1·85	0·91	1·09	2·00
England						
I	53	1·00	1·17	2·72	2·58	5·30
II	354	1·05	1·10	2·08	2·45	4·53
III	219	1·11	1·11	1·66	1·59	3·25
IV	118	1·15	1·17	1·14	1·27	2·41
V	58	1·14	1·17	0·72	1·09	1·81
VI	55	1·09	1·20	0·51	0·84	1·35

The distribution of the sexes in the different areas is shown in Table 4. In three of the Scottish districts, Methlick, Tarves, and Edinburgh, the numbers of males and females were almost equal but in Wemyss, males outnumbered females by forty in a population of 546 and in Dundee there were forty-five more females than males in a population of 583. At each of the English centres there were more females than males but this preponderance

TABLE C

PERCENTAGE OF TOTAL NUMBER OF CHILDREN AND ADOLESCENTS ACCORDING TO AGE

Age—years	*Scotland*		*England*	
	Boys	*Girls*	*Boys*	*Girls*
0— 2	15·10	15·56	24·10	23·09
3— 5	17·42	18·71	20·38	19·80
6— 8	23·82	22·21	17·89	19·00
9—11	19·19	21·20	17·61	17·01
12—14	15·87	15·45	12·36	14·03
15—17	8·60	6·88	7·67	7·07

was slight in Yorkshire households compared with those in Barrow and Liverpool.

Table C shows that among children and adolescents the numbers of the sexes at each age corresponded fairly closely in Scotland and in England. In England, however, the greatest proportion of children were aged 0 to 2 years and in Scotland 6 to 8 years.

For comparison with these percentages the corresponding age distributions of the sexes have been calculated from the tables of the Registrars-General for England and Wales and for Scotland. They are given in Table D.

TABLE D

PERCENTAGE DISTRIBUTION OF CHILDREN AND ADOLESCENTS IN AGE GROUPS IN GENERAL POPULATION

Age—years	*Scotland*		*England*	
	Boys	*Girls*	*Boys*	*Girls*
0— 2	16·48	16·25	15·88	15·68
3— 5	16·20	16·11	15·35	15·27
6— 8	16·13	16·13	15·93	15·95
9—11	16·78	16·82	16·70	16·78
12—14	17·07	17·16	17·09	17·19
15—17	17·36	17·53	19·05	19·12

In comparison with the general population the youngest children were in Scotland, under-represented and, in England, over-represented in the Survey. The proportion of adolescents in the Survey was much lower than in the general population.

In Table 5 the population is classified also according to age, sex, and expenditure group for the two main geographical areas as a whole, Scotland and England. Table E shows the proportion of adults, adolescents (14-17 years) and children (under 14 years) in the groups.

TABLE E

PROPORTIONS OF ADULTS, ADOLESCENTS AND CHILDREN ACCORDING TO SEX IN EXPENDITURE GROUPS IN SCOTLAND AND ENGLAND

District	*Sex*	*Age group*	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Scotland	M	Adults	0·245	0·306	0·365	0·542	0·519	0·603
		Adolescents	0·061	0·066	0·106	0·094	0·090	0·038
		Children	0·694	0·628	0·529	0·363	0·391	0·359
	F	Adults	0·235	0·297	0·413	0·470	0·645	0·630
		Adolescents	0·020	0·048	0·065	0·092	0·047	0·080
		Children	0·745	0·655	0·522	0·438	0·308	0·290
England	M	Adults	0·269	0·336	0·400	0·502	0·611	0·682
		Adolescents	0·056	0·061	0·074	0·096	0·102	0·057
		Children	0·675	0·603	0·525	0·402	0·287	0·261
	F	Adults	0·312	0·311	0·411	0·479	0·519	0·589
		Adolescents	0·070	0·064	0·062	0·062	0·084	0·170
		Children	0·618	0·625	0·526	0·458	0·397	0·241

The proportion of children falls steadily as food expenditure rises, partly due to the effect of the system of economic classification which was discussed above.

These data may be compared with the proportions in the populations of England and Wales and of Scotland which have been calculated from the tables of the Registrars-General and which are given in Table F.

TABLE F

PROPORTIONS OF ADULTS, ADOLESCENTS AND CHILDREN IN GENERAL POPULATION

	Scotland		*England*	
	Males	*Females*	*Males*	*Females*
Adults . .	0·691	0·717	0·738	0·748
Adolescents. .	0·071	0·066	0·051	0·063
Children . .	0·238	0·217	0·210	0·189

The effect of selecting for the Survey those households which had children was naturally to make the surveyed population unrepresentative as a sample of the population of the United Kingdom as a whole.

C. COST OF FOOD

The average cost of food in each expenditure group is given in Table G.

TABLE G

AVERAGE EXPENDITURE ON FOOD IN SHILLINGS AND PENCE PER HEAD PER WEEK

	Group I	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Scotland	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Basis 1	2 7·6	4 0·0	5 7·5	7 4·9	9 2·5	12 0·8
2	2 7·7	4 0·2	5 7·7	7 5·1	9 2·8	12 0·9
3	2 11·4	4 3·5	5 8·3	7 5·2	9 3·0	12 1·0
England						
Basis 1	2 6·6	3 9·8	5 7·3	7 4·3	9 3·0	12 3·5
2	2 6·9	3 10·6	5 8·3	7 5·7	9 3·5	12 4·0
3	2 11·2	4 2·9	5 10·7	7 6·5	9 3·7	12 4·1

On Basis 1 the amount spent on food in Scotland was greater than in England for Groups I to IV but on Basis 2 and 3 this was so only for Groups I and II. In all other groups the amount spent in England exceeded that in Scotland.

The differences in expenditure in the two countries are also shown in Table H where the cost and value of the additions to the home diet are tabulated.

The differences show the actual expenditure on these extras to have been much less in Scottish than in English districts for all expenditure groups. At retail value, Scottish families obtained slightly less than English in Groups I and II, and much less in other groups. The ratios of retail value to actual cost were higher in Scotland than in England, especially in Groups I and II, probably as a result of means tests leading to the more extensive distribution of free or exceptionally cheap welfare foods.

TABLE H

COST AND VALUE OF ADDITIONS TO HOME DIET (PENCE PER HEAD PER WEEK)

	Group I	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Scotland						
Actual cost: difference Bases 2 and 1	0·10	0·23	0·27	0·15	0·26	0·08
Retail value: difference Bases 3 and 2	3·83	3·48	0·79	0·31	0·47	0·17
Ratio retail value: actual cost	38·3	15·1	2·9	2·1	1·8	2·1
England						
Actual cost: difference Bases 2 and 1	0·37	0·81	1·02	1·36	0·59	0·55
Retail value: difference Bases 3 and 2	4·59	5·07	3·43	2·26	0·72	0·66
Ratio retail value: actual cost	12·4	6·3	3·4	1·7	1·2	1·2

D. FOODSTUFFS

1. General observations

The amounts of the several types of foodstuffs which were available in the households are detailed in Tables 7 and 8 for districts separately, in Tables 9 and 10 for the whole of Scotland and of England, and in Table 11 for all households in the Survey. The differences between regions must, however, be compared only in general terms and with due regard to the dietary habits of the population and to the number of families which appeared in the groups. For example, the different districts showed a considerable range in the consumption of oatmeal products from 36 oz. per head per week in Group III at Barthol Chapel to none in Groups I at Fulham and V at Liverpool. When these two English groups in which none was used are excluded, it appears, somewhat surprisingly, that the lowest consumption of that traditionally Scottish article of diet was in West Wemyss, Fife. Again the use of such foods as milk, potatoes and oatmeal in the rural districts of north-east Scotland was influenced by the system of payment of farm workers. In these districts it was customary that farm servants received a supply of food in kind, usually milk, potatoes, and oatmeal. Such local customs, with random fluctuations due to small numbers, explain some of the differences between averages shown in Tables 7 and 8. It seems more important that general trends rather than details of consumption should be considered.

2. Milk and milk products

The quantity of milk consumed increased steadily in all areas as the total expenditure on food rose. The amounts of liquid and condensed milk, expressed in terms of liquid milk, rose from 1·00 pint per head per week for Group I to 5·50 pints per head per week for Group VI as is shown in Table J.

TABLE J

CONSUMPTION OF LIQUID AND CONDENSED MILK IN TERMS OF LIQUID MILK—ALL DISTRICTS: PINTS PER HEAD PER WEEK

	Group I	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
As whole milk . . .	0·44	1·16	2·32	3·09	4·14	5·44
As condensed milk * . .	0·56	0·54	0·43	0·25	0·24	0·06
Total	1·00	1·70	2·75	3·34	4·38	5·50

* 1 oz. condensed milk = $\frac{1}{8}$ pint whole milk.

Had skimmed and butter milk been included in the total the overall amounts would have been greater; but these have not been added because, except for two families, one in each of the Barrow and Yorkshire Groups II, these forms had been recorded nowhere in England other than at Wisbech and, in Scotland, it was only in the districts with an already high consumption of fresh milk that these would have made much difference to the total. It was in the coal-mining areas in both Scotland and England that least milk was used.

3. Eggs

The numbers of eggs used increased regularly in nearly all districts as food expenditure increased. Between the Scottish and English centres taken together there was little difference but, within the expenditure groups, there were considerable variations.

The households using fewer than one egg per head per week were, with one exception, in Group I. In Scotland such households occurred in two districts, Hopeman and Dundee, but in England they occurred in all districts except Bethnal Green and Yorkshire which latter had but a single household. Rural areas where eggs might have been expected to be more readily available, showed no greater consumption than urban districts. In England it was in the rural area, Wisbech, that the lowest number, 0·44 per head per week, was recorded; in Scotland it was in the urban area of Dundee that an almost equally low figure, 0·45 per head per week, appeared. In Scotland less use of eggs was being made also in the country areas, Barthol Chapel, Methlick, and Tarves, than in the cities of Aberdeen and Edinburgh.

There was no evidence that the consumption of eggs was influenced by the time of year at which the Survey data had been collected.

4. Meat, smoked pig meat and fish

The consumption of meat by households in expenditure Group I varied greatly among the English districts. In other groups also in both Scotland and England the range was considerable. In Scotland, the amount of meat and smoked pig meat eaten was, in general, less than that used by corresponding groups in England. For meat there was again a steady rise in consumption with rising expenditure on food in the two countries taken as wholes, but such an increase was not so definite for smoked pig meat.

As was to be expected the largest consumers of fish in the lower expenditure groups were the inhabitants of the fishing village of Hopeman but, at that centre only three Groups, II, III, and IV, were represented and, in them the amounts of fish used differed very little. Consumption of fish by district and by expenditure group in each district showed greater variation in Scotland than in England.

When these flesh foods are considered together, and for the whole of Scotland and of England, the amount used increased with increasing expenditure on food, but the Scottish families ate uniformly smaller amounts than did the English in the corresponding expenditure groups.

5. Animal fats (including butter) and vegetable fats

In the analysis of the data consumption of butter and of other fats, distinguished as of animal or vegetable origin, was considered. In both Scotland and England the amount of butter used increased fairly regularly as expenditure on food rose but there was no strictly corresponding fall in the amounts of fats of vegetable origin, margarine and other compound fats. For the English districts as a whole fat from vegetable sources remained at above 4 oz. per head per week for expenditure Groups I to IV and fell to about 2½ oz. per head per week for the two upper groups. A similar downward tendency was exhibited by the overall figure for Scottish centres but the falling off began at the lower level of Group III. The lower total consumption of fat in the Scottish districts was attributable largely to less use of margarine. The overall average for Group I households in England and for those in Groups I and II in Scotland indicate an amount of between 5½ and 6 oz. per head per week as that below which the total purchase of fat was unlikely to fall.

6. Vegetables and Fruit

For all vegetables together, fresh, dried or canned, the quantities used in Scotland and England were similar in the households in the lower expenditure groups but differed in the higher as is shown in Table K.

TABLE K

CONSUMPTION OF VEGETABLES AND POTATOES (OZ. PER HEAD PER WEEK)

	Group I	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
All vegetables other than potatoes						
Scotland . .	13·37	12·05	14·15	18·64	20·82	24·59
England . .	12·13	14·64	18·54	24·65	31·41	41·77
Green vegetables						
Scotland . .	0·26	1·45	1·94	3·31	5·70	4·36
England . .	5·79	8·22	8·92	10·85	18·04	21·45
Root vegetables other than potatoes						
Scotland . .	6·41	4·91	6·04	7·76	7·66	9·35
England . .	1·83	1·95	2·60	3·45	2·94	7·30
Potatoes						
Scotland . .	31·82	49·43	61·57	61·31	62·71	59·39
England . .	44·59	52·42	58·90	63·66	56·28	54·39

As expenditure on food rose so did the difference between the amounts recorded for corresponding expenditure groups in the two countries. The difference resulted from the much higher consumption of green vegetables in England and existed in spite of the fact that in all groups the amount of root vegetables used was greater in Scotland than in England.

Consumption of potatoes, as judged from the data for Groups III, IV, V, and VI for the whole Survey appeared to reach its limit at about 60 oz. per head per week and, considering their low cost, the amount used by the families in Group I, 42 oz. per head per week, was surprisingly low.

For fruit, in the same way as for vegetables, the amount per head per week increased as expenditure on food rose through the groups. The quantities used in the different forms in England were generally much greater than those in Scotland (Table L).

TABLE L

CONSUMPTION OF FRUIT (OZ. PER HEAD PER WEEK)

	Group I	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Fresh fruit						
Scotland . .	0·82	3·50	6·71	11·60	21·52	29·31
England . .	3·03	6·57	12·01	17·61	28·52	47·38
Canned fruit						
Scotland . .	nil	0·24	0·69	1·15	2·37	6·37
England . .	0·26	0·85	2·20	4·30	5·01	5·74
Dried fruit						
Scotland . .	nil	0·18	0·36	1·22	1·71	3·50
England . .	0·22	0·56	0·81	1·57	1·90	2·82

Greater supplies on the market in England than in Scotland may have contributed to this result for fresh fruit in particular but the larger amounts of the canned and dried forms used in England indicate that a higher demand for fruit then existed in English as compared with Scottish households.

7. Cereals and cereal products

Differences in cereal consumption must, in the first place, be considered in relation to systems of baking. Where bread was commonly baked at home, as in Yorkshire, the amount of flour used was much larger than where bread was bought. To a lesser degree distance from shops would tend to make the housewife in a rural area use relatively more flour in home baking than the city-dweller as shown in Table M. Barrow, as an urban area, is an obvious exception and appears to share the traditional home-baking customs of Yorkshire.

When all forms of wheaten products were reduced to terms of flour the smallest amounts were seen generally to be used in the Scottish rural areas, the fishing village of Hopeman and in one of the London Boroughs (Fulham) while the largest were recorded in the mining areas of both Scotland and England and in the English rural district, Wisbech. In contrast with foodstuffs already discussed, the total amount of wheaten products seemed to bear no direct relation to total food expenditure. This is true, also, of individual wheaten products. Only for bread did the data for the whole of Scotland and England show some connection, in that the quantity eaten

TABLE M

CONSUMPTION OF WHEATEN PRODUCTS IN TERMS OF FLOUR (OZ. PER HEAD PER WEEK)

(*a*) Wheaten products other than flour; (*b*) Flour

	Group I			*Group II*			*Group III*			*Group IV*			*Group V*			*Group VI*		
	(*a*)	(*b*)	(*total*)	(*a*)	(*b*)	(*total*)	(*a*)	(*b*)	(*total*)	(*a*)	(*b*)	(*total*)	(*a*)	(*b*)	(*total*)	(*a*)	(*b*)	(*total*)
Scotland																		
Aberdeen	—	—	—	52·82	1·00	53·82	54·46	2·15	56·71	41·20	2·33	43·53	39·28	7·05	46·33	41·22	15·84	57·06
Kintore	—	—	—	38·31	2·94	41·25	32·03	nil	32·03	52·36	5·50	57·86	—	—	—	—	—	—
Hopeman	—	—	—	40·55	0·79	41·34	41·00	1·61	42·61	44·45	1·54	45·99	—	—	—	—	—	—
Barthol Chapel	—	—	—	27·36	5·95	33·31	31·55	7·00	38·55	35·52	10·08	45·60	40·96	20·46	61·42	44·97	4·62	49·59
Methlick	—	—	—	32·03	7·03	39·06	37·73	7·03	44·76	41·11	5·09	46·20	39·35	5·75	45·10	33·02	3·26	36·28
Tarves	—	—	—	32·86	6·40	39·26	37·79	5·09	42·88	41·83	4·83	46·66	40·10	4·78	44·88	35·09	5·52	40·61
West Wemyss	—	—	—	56·89	0·19	57·08	58·64	0·96	59·60	73·20	1·51	74·71	77·11	1·02	78·13	68·16	3·66	71·82
Coaltown of Wemyss	—	—	—	59·68	0·07	59·75	68·09	3·08	71·17	66·63	4·87	71·50	64·96	3·20	68·16	66·43	5·62	72·05
Dundee	37·49	0·68	38·17	52·22	1·01	53·23	56·58	3·17	59·75	51·49	4·77	56·26	48·73	5·36	54·09	38·43	9·17	47·60
Edinburgh	50·93	0·12	51·05	61·83	1·03	62·86	64·18	1·25	65·43	69·47	nil	69·47	—	—	—	—	—	—
England																		
Barrow	32·34	4·57	36·91	27·26	14·76	42·02	39·41	15·23	54·64	43·42	8·82	52·24	32·30	22·67	54·97	46·69	13·62	60·31
Liverpool	45·38	2·53	47·91	53·41	2·97	56·38	56·03	3·13	59·16	32·73	3·02	35·75	35·43	5·64	41·07	39·87	7·50	47·37
Yorkshire	10·23	48·00	58·23	12·00	40·29	52·29	14·59	43·22	57·81	16·97	57·06	74·03	20·87	79·37	100·24	32·76	40·88	73·64
Wisbech	48·41	5·41	53·82	47·46	12·62	60·08	48·26	15·72	63·98	49·36	18·24	67·60	55·34	18·10	73·44	56·49	26·86	83·35
Fulham	29·03	0·37	29·40	44·15	2·11	46·26	43·20	4·10	47·30	39·78	4·91	44·69	38·56	4·53	43·09	42·05	5·14	47·19
Bethnal Green	34·65	2·41	37·06	39·90	4·09	43·99	48·66	5·49	54·15	50·30	7·30	57·60	44·96	6·07	51·03	51·74	10·62	62·36

seemed to diminish as the amount of money spent on food went up. Table N, which gives the consumption per head per week of rolls, buns and scones, indicates a preference of Scots for wheat products in these forms.

TABLE N

CONSUMPTION OF ROLLS, BUNS AND SCONES, FOR SCOTTISH AND ENGLISH DISTRICTS

(OZ. PER HEAD PER WEEK)

Districts	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
All Scotland . . .	4·69	8·98	12·96	15·06	16·28	10·65
All England . . .	0·45	0·65	1·47	2·32	1·95	2·96

When the total consumption of cereals and cereal products is considered the use of oatmeal in Scottish areas complicates interpretation of the figures (Table P).

TABLE P

CONSUMPTION OF TOTAL CEREALS AS FLOUR, OATMEAL PRODUCTS AND OTHER FARINACEOUS FOODS

(OZ. PER HEAD PER WEEK)

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Scotland						
Aberdeen . . .	—	57·40	66·50	53·31	60·69	72·70
Kintore . . .	—	55·89	51·12	79·86	—	—
Hopeman . . .	—	49·20	48·24	57·64	—	—
Barthol Chapel . .	—	74·31	75·09	88·99	97·33	90·94
Methlick . . .	—	75·96	81·70	70·76	77·17	77·01
Tarves . . .	—	79·06	80·71	77·23	66·67	61·43
West Wemyss . .	—	57·43	62·94	78·66	82·70	80·14
Coaltown of Wemyss	—	61·49	75·45	75·51	73·38	80·52
Dundee . . .	40·66	56·52	62·48	69·37	65·83	54·88
Edinburgh . . .	54·81	66·88	73·76	69·47	—	—
England						
Barrow . . .	39·87	43·74	58·46	57·56	59·15	66·74
Liverpool . . .	50·16	59·22	64·30	39·59	44·51	50·50
Yorkshire . . .	60·73	54·11	62·95	77·60	104·88	80·54
Wisbech . . .	55·59	61·99	67·12	71·98	76·66	90·15
Fulham . . .	29·40	48·03	50·04	47·88	47·22	51·59
Bethnal Green . .	38·50	46·57	57·90	62·11	59·32	71·04

In general, in Scottish rural districts, the families consumed more cereal than did those in other places. Of the other districts Hopeman and Fulham showed for total cereal, in the same way as for wheaten products, the lowest amounts and the mining districts maintained their position as areas of high consumption. The high consumption of cereal by Edinburgh households and the smallness of the amounts used by the families in the three upper expenditure groups at Liverpool are findings for which no explanation can be offered.

8. Sugar and beverages

The data for the amounts of sugar used showed some variation. In a number of the districts the quantity did show a relation to the total expenditure on food. In Bethnal Green, Wisbech, and Yorkshire (except for its Group II families) in England and at Aberdeen, Wemyss, and Edinburgh in Scotland, consumption increased with rising expenditure on food. In other areas there was no constant trend or, as for Fulham and Dundee, there was little difference with expenditure. The smallest amount per head per week was 8·48 oz. shown by the four families in Group I at Coaltown of Wemyss. The greatest, 29·95 oz., was in the three households in Group VI in Yorkshire but this latter figure was weighted by a single family of two adults and a child aged one year who accounted for 7 lb. 6 oz. of sugar during the week of the Survey. It is of interest that, at a time when sugar was both plentiful, and at 2½d. per lb. cheap, the amount used per head per week in all Survey households together rose from just over 10 oz. in Group I to about 19½ in Group VI.

Jams, marmalade, and syrups were used to a greater extent in Scotland than in England (Table Q). This difference is probably associated with the greater use of rolls, buns, and scones in Scotland. The Edinburgh households in each of the expenditure groups represented, differed from the others in Scotland in the relatively small use which was made by them of jams and syrups.

TABLE Q

CONSUMPTION OF JAM, MARMALADE AND SYRUPS

(OZ. PER HEAD PER WEEK)

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Scotland						
Aberdeen	—	3·46	9·79	10·01	10·22	8·97
Kintore	—	9·88	12·41	5·88	—	—
Hopeman	—	8·15	9·32	8·46	—	—
Barthol Chapel	—	13·00	10·92	12·02	18·40	13·20
Methlick	—	10·12	14·21	13·10	12·95	24·82
Tarves	—	9·53	11·89	9·73	11·31	9·58
West Wemyss	—	3·92	6·40	6·58	7·36	11·66
Coaltown of Wemyss	—	5·09	10·27	7·63	9·98	9·02
Dundee	8·06	4·53	5·43	9·25	12·20	11·49
Edinburgh	1·14	3·48	4·18	2·91	—	—
England						
Barrow	3·06	2·00	4·02	4·58	7·14	8·26
Liverpool	1·44	3·24	3·32	4·27	5·24	10·19
Yorkshire	nil	2·43	3·61	3·39	3·21	9·19
Wisbech	1·14	2·67	4·44	5·06	6·15	9·52
Fulham	1·21	2·45	3·26	4·28	4·36	7·04
Bethnal Green	1·27	2·29	2·92	2·97	5·00	2·95

The amounts of beverages, such as preparations of cocoa and chocolate, used were small and, on only a few occasions did they exceed ½ oz. per head per week in any of the expenditure groups. The contributions made to the home diet by such preparations were very small.

9. Comparison with estimates of consumption of foods

Before proceeding to an analysis of the amounts of nutrients supplied by these quantities of foods which were found to have been consumed, it will be of interest to compare the Survey data with the estimates of consumption which had previously been made. The background of the Survey was the picture drawn by Orr in *Food, Health, and Income*, where it had been written (p. 13) that it was:

> " the most accurate which can be drawn under the circumstances, and that therefore it can serve as a working hypothesis, provided that it is always kept in view that it is only an approximation which will need to be revised from time to time as further information accumulates ".

The information on the consumption of foods which has just been summarised was the first to be available after these estimates had been prepared and a comparison of the Survey findings seemed, therefore, to be logical.

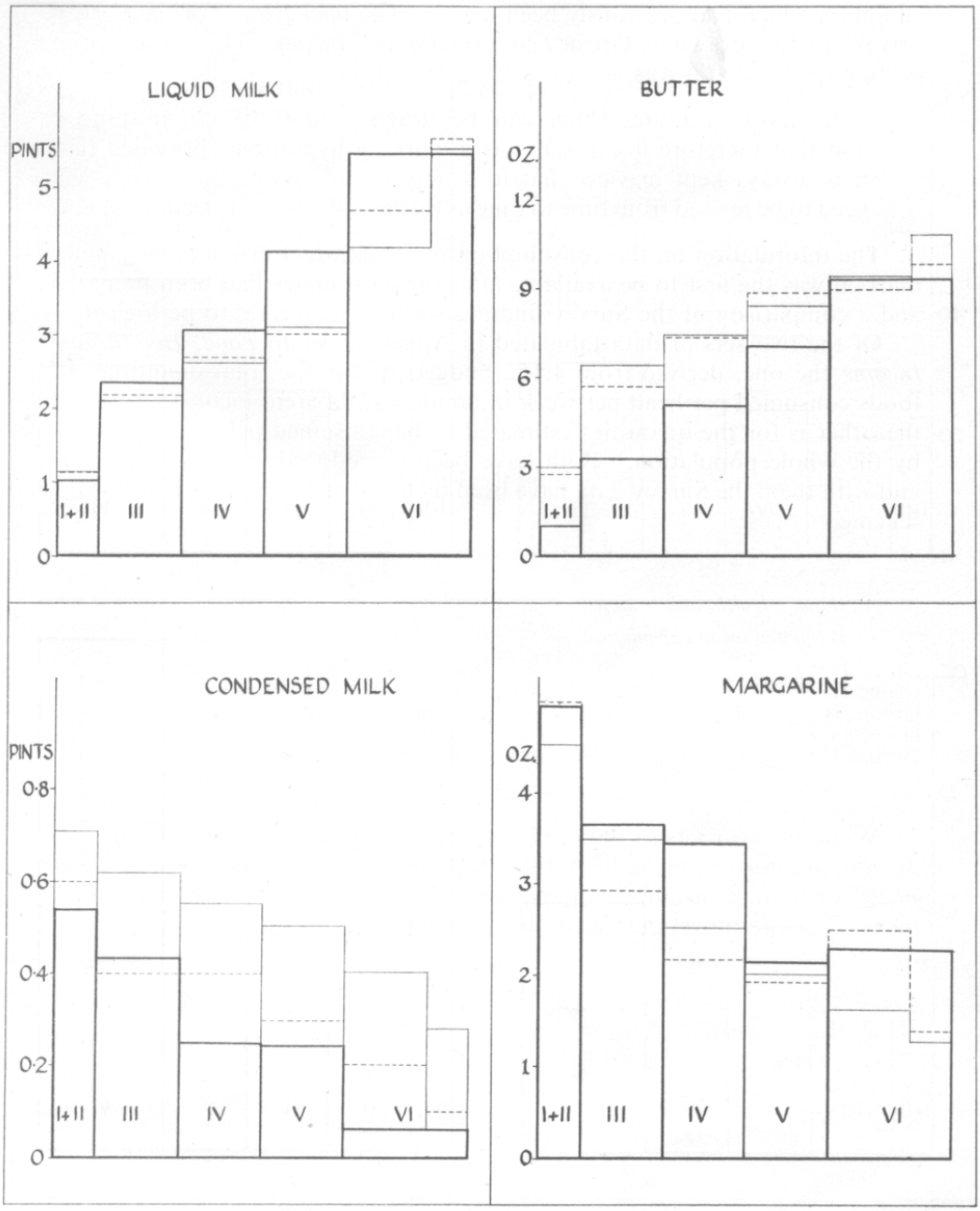
Of the two sets of data tabulated in Appendix VI to *Food, Health, and Income* the one, derived from 1,152 budgets, is for the total quantities of foods consumed per head per week in families at different income levels and the other is for the quantities estimated to be consumed per head per week by the whole population. Both have been reproduced in Graphs A to D and with them the Survey data have been included according to the following scheme.

" Food, Health, and Income "		*Survey*	
Estimated mean expenditure		*Actual expenditure*	
Group I	4s.	Groups I and II	Up to 4s. 11½d.
Group II	6s.	Group III	5s. to 6s. 11½d.
Group III	8s.	Group IV	7s. to 8s. 11½d.
Group IV	10s.	Group V	9s. to 10s. 11½d.
Groups V and VI	Over 10s.	Group VI	Over 11s.

While the two sets of data are not strictly comparable those from *Food, Health, and Income* being for total food consumed and those for the Survey being for home consumption only, they are, in general, in reasonable agreement. For potatoes and sugar their agreement is almost complete.

CONSUMPTION PER HEAD PER WEEK OF CERTAIN FOODSTUFFS BY FOOD EXPENDITURE GROUPS

GRAPH A.



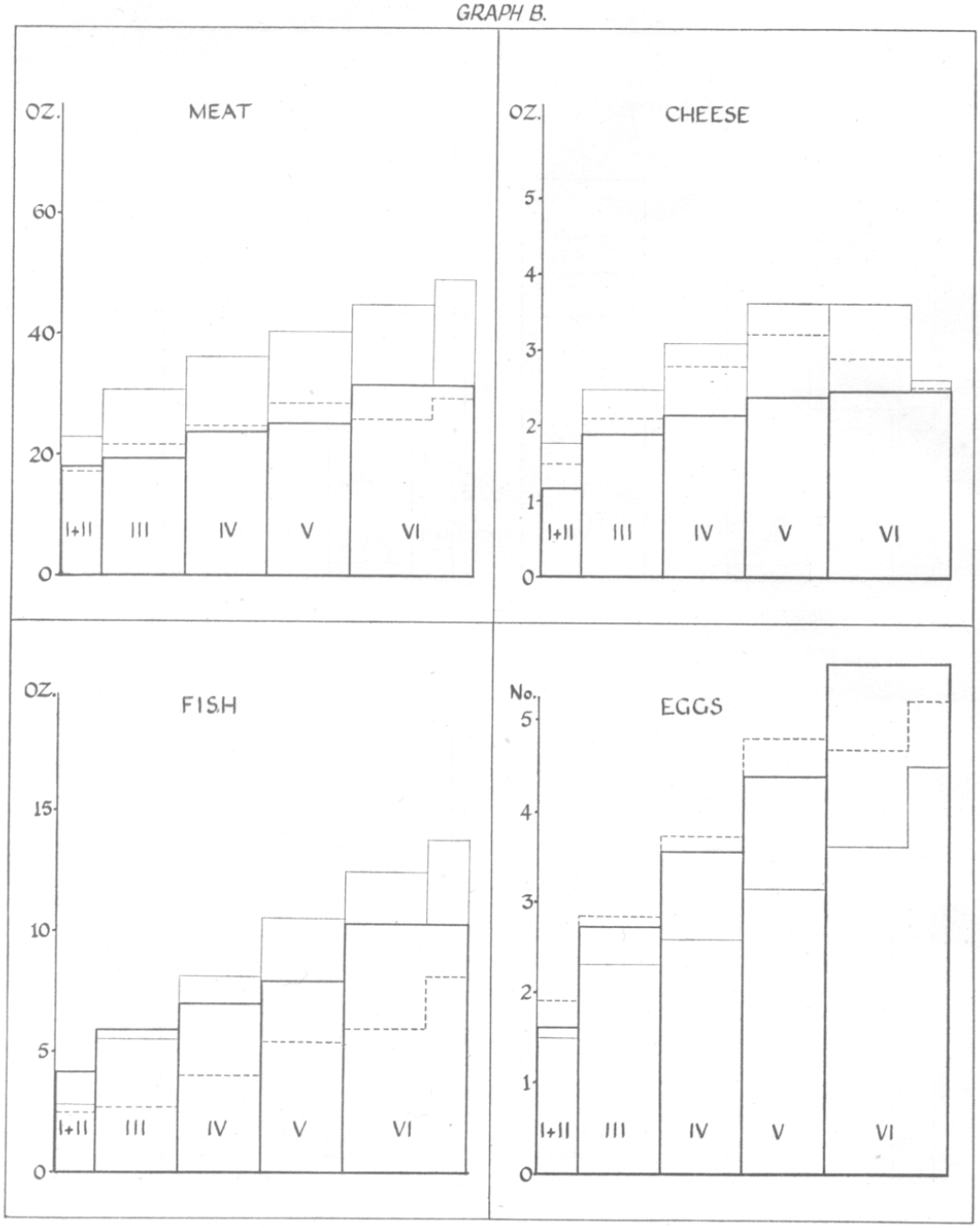
Survey data ——————

Food, Health and Income data—Households ----------

Estimate for whole population ——————

CONSUMPTION PER HEAD PER WEEK OF CERTAIN FOODSTUFFS BY FOOD EXPENDITURE GROUPS

GRAPH B.

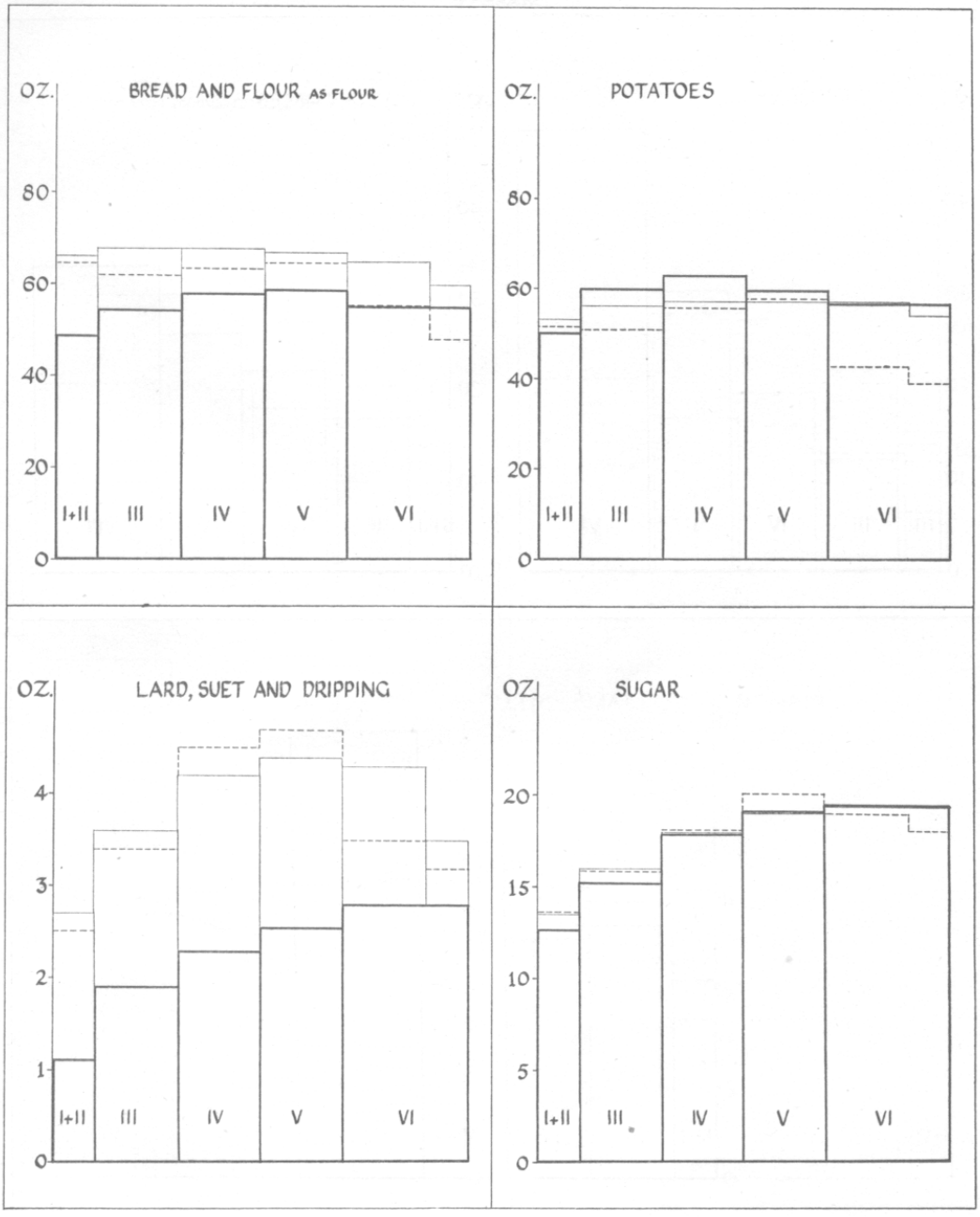


Survey data ——————

Food, Health and Income data—Households ..... Estimate for whole population ——————

CONSUMPTION PER HEAD PER WEEK OF CERTAIN FOODSTUFFS BY FOOD EXPENDITURE GROUPS

GRAPH C.



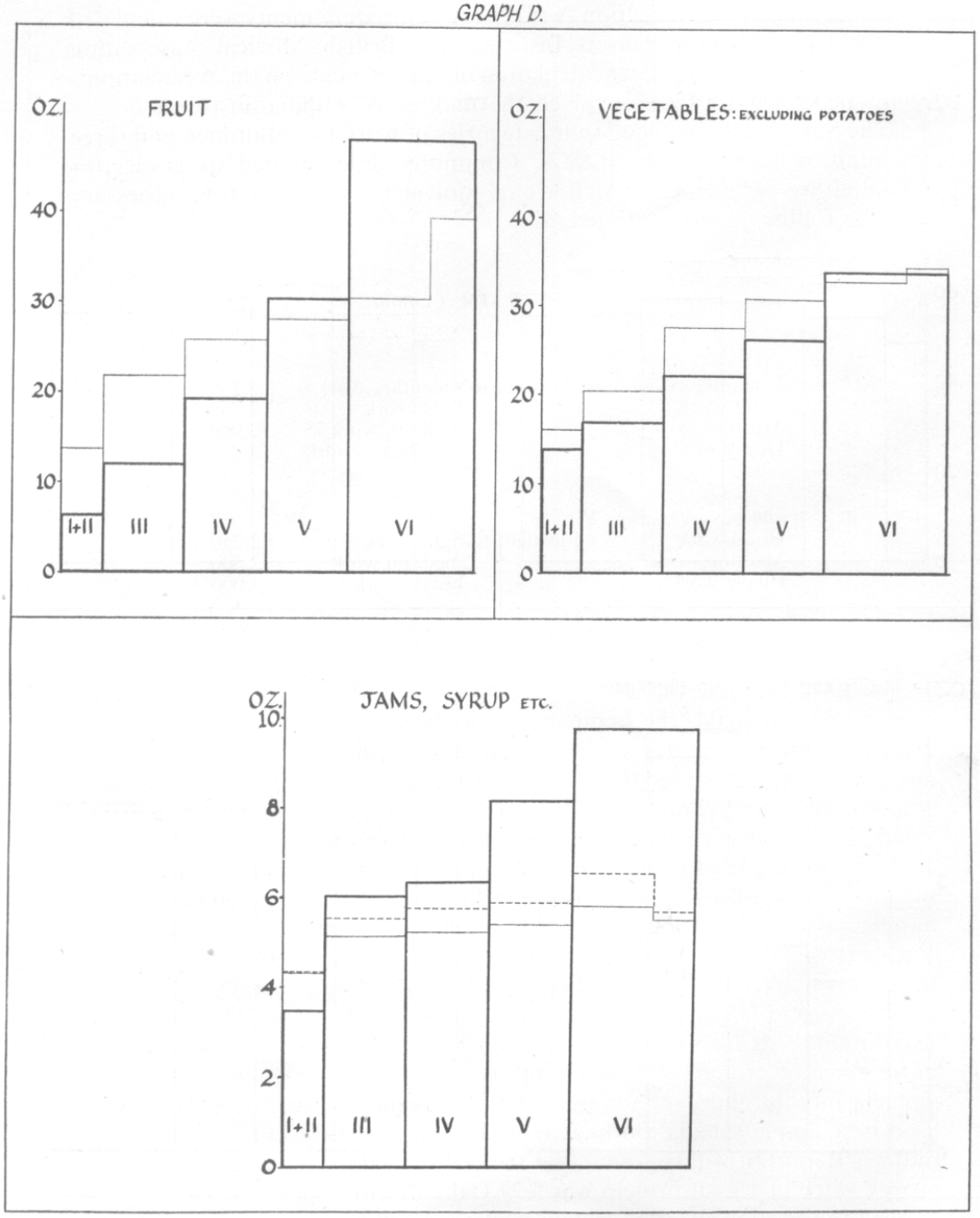
Survey data ——————

Food, Health and Income data—Households ----------

Estimate for whole population ——————

CONSUMPTION PER HEAD PER WEEK OF CERTAIN FOODSTUFFS BY FOOD EXPENDITURE GROUPS

GRAPH D.



Survey data ——————

Food, Health and Income data—Households ----------

Estimate for whole population ——————

E. NUTRIENTS

1. Estimates of requirements

As already noted in Section A (6) (page 22), requirements were calculated on the basis of both Rowett Institute and British Medical Association standards (1950). This later calculation of requirements on the Association's recommended allowances involved the making of some adjustment.

The Survey data included four categories of work for adult men and three for adult women but the B.M.A. Committee differentiated six grades for men and five for women. A choice of equivalents was, therefore, necessary and the following were selected.

Survey	*B.M.A. Committee*	*Calories daily*
Men		
Unemployed *	equivalent to sedentary work	2,250
Light work	„ „ light work	2,750
Medium work	„ „ medium work	3,000
Heavy work	„ „ very heavy work	4,250
Women		
Housework	equivalent to light work	2,250
Medium work	„ „ medium work	2,500
Heavy work	„ „ heavy work	3,000

* Taken deliberately as an allowance sufficient for the maintenance of a reasonable level of fitness.

In order to make the comparison of the energy values of the Survey diets with the Committee's recommended allowances the factors 4 and 9, now more commonly used than those of 4·1 and 9·3, were applied to the mean amounts of carbohydrate and fat which the Survey had indicated as being eaten per head by each expenditure group at each centre. (Tables 12 and 13.)

For allowances of protein the Committee based its recommendations on the assumption of a simple relationship between total energy intake and the number of calories from that source which had been strongly stressed by Cuthbertson (1940). It indicated that during the period 1940 to 1945, when the energy derived from protein in typical U.K. dietaries generally represented between 10 and 14 per cent of the total calories, health and well-being had not deteriorated. It also expressed the belief that 14 per cent of the calories in the form of protein of a mixed diet is sufficient for pregnant and nursing women, infants, children, and adolescents. If this measure of sufficiency be used in a simple calculation back from the data in Table 1 (c) of the Committee's Report, it will be found that the factor used for the calculation of the energy value of 1 g. of protein was 3·77 Cal. Further, if this same factor be applied to the allowances of protein recommended for the remaining population groups in the same Table, i.e. for adult men and women, the percentage of calories which would be provided by the protein in their diet can be established as 11 per cent. Accordingly, for the comparison of the Survey data with the B.M.A. standards, the necessary recalculations were, on the basis of these deductions, made with the energy value of 1 g. of protein as

3·77 Cal. and with the amounts of protein such as to provide 11 per cent of their total energy intakes for adults of both sexes and 14 per cent of their intakes for pregnant and nursing women, infants, children, and adolescents.

For estimations of calcium requirements the only deviation from the Committee's recommendations was that an allowance of 1·15 g. was made for pregnant women at any stage instead of 0·8 and 1·5 g. for the first and second halves of pregnancy. Allowances of vitamin A and vitamin C were as recommended by the Committee.

Detailed comparison of the Survey data with the Committee's recommended allowances was not made for vitamin B_1, since, like the Rowett Institute standard, the Committee's allowance was based on a relationship to total calorie intake. In the Rowett Institute standard the requirement in international units was taken to be one-fifth of the number of Calories supplied which is equivalent to 0·6 mg. for 1,000 Cal. The Committee's recommendation for all population groups except nursing mothers was 0·4 mg. per 1,000 total Calories.

For each constituent the intake per head of the group was expressed as a percentage of the group's estimated requirement and it should be noted that, since requirements per head were fitted to the group according to its composition in terms of adults, adolescents, and children, these comparisons between intakes and requirements are exact. The excess of children in the poorer groups is allowed for and the type of distortion discussed on page 25 does not affect the relationship.

2. Comparison of intakes with estimates of requirements

Intakes in relation to Rowett Institute standards are given in Tables 15 and 16, and 18 to 21, and in relation to the B.M.A. standards in Tables 22 to 26. Table 27 summarises these for Scotland and England and for the country as a whole.

On the Rowett Institute standards the average diet fell short of calorie requirements in Groups I and II, of protein requirements in Groups I, II, and III, and of calcium, vitamin A, and vitamin C requirements in all but Group VI. There were steady gradients with expenditure on food, deficiencies being greatest in the poorer groups and excesses, when present, being greatest when expenditure on food was highest. The picture is similar for calories, calcium, and vitamin A when the B.M.A. allowances are used as standards.

The greatest difference between the two standards is in respect of vitamin C where the comparison with the Rowett Institute scale shows large or appreciable *deficiencies* in all groups except Group VI while comparison with the B.M.A. standard shows an *excess* for all groups ranging from about a fifth of the suggested allowance in Group I to one of two-and-a-half times the suggested allowance in Group VI. This discrepancy is readily explained in that the one standard estimates the desirable content of the raw uncooked food and the other the desirable net intake. Apart from this difference which is discussed fully in Appendix 1, agreement between the findings based on the two scales is remarkably good when one bears in mind that the Rowett Institute standards were devised in 1938 and that the B.M.A. allowances were arrived at independently in 1950.

The data in Table 27 show that, for calories, protein and calcium, deficiencies were generally more marked in England than in Scotland but that

for vitamin A and vitamin C the position was reversed. This difference for these vitamins is understandable, fruit and vegetables being generally more easily obtainable and cheaper in England than in Scotland. It may not be so immediately obvious why the Scottish families should have obtained, on an average, relatively more calories, protein and calcium than the English at any given level of expenditure on food. It seemed possible that the Aberdeenshire rural areas, Tarves, Methlick, and Barthol Chapel might have weighted the results unduly but when the data for these were removed from the Scottish totals as in Table R, it was found that by the Rowett Institute standards, supplies of calories, protein and calcium remained relatively better for Scotland than for England and that for all expenditure groups those of vitamins A and C remained relatively better for England than for Scotland.

TABLE R

ENERGY AND NUTRIENTS: PER CENT. OF REQUIREMENTS FOR SCOTLAND (EXCLUDING TARVES DISTRICT) AND ENGLAND

		Group I	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Calories	*Scotland*	78·7	90·2	93·6	106·2	111·7	130·0
	England	70·6	88·8	102·3	108·9	117·4	121·9
Protein	*Scotland*	66·7	80·4	87·7	99·5	110·5	128·6
	England	59·0	75·0	92·5	101·3	106·5	111·8
Calcium	*Scotland*	30·9	40·9	54·5	65·0	85·4	114·8
	England	25·3	35·5	52·2	67·1	84·2	107·4
Vitamin A	*Scotland*	19·8	33·2	59·3	67·7	78·2	97·8
	England	32·6	46·2	62·8	81·4	87·1	113·6
Vitamin C	*Scotland*	19·7	30·6	42·3	51·5	61·8	76·9
	England	37·3	46·0	58·0	73·5	93·2	112·4

Some of the findings will now be considered in more detail in relation to the Rowett Institute standards (Tables 15, 16, 18 to 21).

Calories

In Scotland the Tarves, Methlick, and Barthol Chapel families were outstanding in obtaining, for all expenditure groups, more than their estimated needs of energy. The excess over requirements ranged from about 10 per cent in Group II to between 26 and 38 per cent in Group VI; the one family in Group V at Barthol Chapel had, with 148·3 per cent, almost half as much again as its estimated requirement. Agricultural work in which most of the people in these districts were engaged was classified as medium and this may have been an underestimate giving rise to an appearance of excess in the supplies. It is of interest that in the mining areas of Scotland estimated needs were similar to those of the rural areas but supplies were relatively lower. In the comparable districts of England the picture tended to differ. At the rural area, Wisbech, only Groups IV, V, and VI were getting definitely more than their estimated requirements of calories. In the mining district in Yorkshire

the excess of supply over estimated requirement was relatively greater than in the rural district; it was here too that the highest figure appeared, the four families in Group V showing an excess of intakes over estimated needs which amounted to 61 per cent. It is also of interest that the areas and groups where deficits were found to be greatest did not show these to be associated obviously with the amount of unemployment recorded. Examples of this absence of correlation occurred in Group I at Liverpool where, although unemployment was reported for nine of the ten families studied, 87 per cent of the calorie requirement was being supplied; in Group I at Bethnal Green, on the other hand, unemployment was less occurring in only fifteen of the twenty-seven families studied but energy supplies were considerably lower at 66 per cent of estimated needs.

Protein

Table 16 gives the comparison with the Rowett Institute standards and it will be seen that shortages of protein were, in general, greater in relation to estimated needs than were shortages of calories. Protein intake is, of course, quite closely linked with energy intake (Cuthbertson, 1940).

Leitch (1942) has pointed out that " unless the diet contains a very high proportion of sugar, highly processed cereals and fat it will be difficult to plan a diet providing less than 10 per cent of its calories as protein ". Table 17 shows the average percentage of total calories derived from protein in the districts and expenditure groups. In two of these, Fulham Group I with two families and Yorkshire Group VI with three families, the percentage did fall below 10 per cent. It is of interest that the Yorkshire Group VI included the family to which particular reference has already been made (p. 35) for its high consumption of sugar. In Scotland the percentage of calories from protein was, in some areas, above 12.

The question of the percentage of total protein which was of animal origin is also important. Tables 12 and 13 show the means for the amounts of total and of animal protein which were provided by the diets in the different districts. From the summaries in Table 14 the following Table S has been prepared to show the average percentage of total protein which was derived from animal sources in the diets for Scotland, England and for the whole Survey.

TABLE S

ANIMAL PROTEIN AS PERCENTAGE OF TOTAL PROTEIN

	Group I	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Scotland .	34·5	36·9	40·8	44·7	47·7	57·1
England .	36·8	40·8	44·5	48·3	51·6	56·3
All districts	31·3	39·4	43·0	46·6	49·6	56·7

The continued rise in the proportion of animal protein with increase in expenditure on food corresponds with the increase in consumption of milk, eggs, and meat which was found to occur as the amount spent on food rose.

Calcium

The data for Scotland and England (Table 27) indicate a gross shortage of calcium in the lower expenditure groups but here again special consideration

must be given to the influence of the greater consumption of milk in Barthol Chapel, Methlick, and Tarves compared with the other districts in Scotland and with those in England. In general terms it may be said that, excluding these rural areas in Scotland, the populations in Groups I, II, and III were receiving only about one-half of their estimated requirement and that for nearly all of the families surveyed, except those in Group VI, the intake of calcium was below the level of estimated requirement. The shortage of calcium was most pronounced in the families in Group I in England of which there were fifty-three with 396 persons; only one-quarter of their estimated need was being supplied.

Vitamin B_1

Table 19 shows that in Groups V and VI at all centres except Coaltown of Wemyss, Barrow, and Fulham, supplies of vitamin B_1 were probably adequate in that they exceeded estimated requirements or covered at least 90 per cent of them. In all groups up to and including Group III except those in rural Aberdeenshire where consumption of oatmeal was high, there were deficiencies which ranged from a quarter to half of the estimated needs.

Vitamins A and C

For these vitamins comparisons were probably less exact since requirements were taken to be fixed amounts per head for the individuals comprising the groups. As is shown in Table 20 the intake of vitamin A fell short of requirements in nearly all expenditure groups other than Group VI and in the lower groups there appeared on occasion to be a supply amounting only to about one-quarter of requirements. With regard to vitamin C the standard of 75 mg., referring as it does to the uncooked edible portion of the diet, may, as explained in Appendix 1, be regarded as reasonable and against it the shortage in some of the Scottish districts may have been as much as four-fifths of the estimated needs (Table 21). In England too, where as has already been suggested vegetables and fruit were probably more plentiful in amount and cheaper in price than in Scotland, only in Group VI at Barrow, Liverpool, and Fulham and in Groups IV and V at Fulham was the average supply greater than estimated requirement.

Iron

The data for intakes of iron have not been tabulated in relation to requirements. The smallest amount being provided, 5·6 mg. per head per day, was for those households in Group I at Barrow. In most areas the amount supplied in the diet rose with expenditure on food and the range was from about 7 mg. in the Group I to about 17 mg. in the Group VI families. No standard of requirement had been set but, if 12 mg. per head per day, as achieved by Group III in Scotland and Group IV in England, be taken as desirable, the proportion of the population studied in England receiving less than its needs of iron was considerably greater than that in Scotland; in Scotland the groups getting less than 12 mg. included 50 per cent of the population while in England they included 87 per cent.

3. Wastage of food

Throughout the foregoing discussion no attention has been given to losses likely to occur in the households from wastage of food. The possibility of

such losses had been kept in mind when the Survey was planned, and as already mentioned (pp. 18, 20) a number of households were intensively surveyed in order to provide information on the subject. This waste consisted of edible matter which might have been consumed; it did not include material more correctly described as refuse and for which allowance had been made in the calculation of the amounts of nutrients provided. In the estimation of food value lost in this way reference has been made only to calories.

The households so examined were situated, in Scotland, in the mining villages of West Wemyss and Coaltown of Wemyss and in the cities of Aberdeen and Dundee; in England they were in rural Wisbech and in the London Boroughs, Fulham and Bethnal Green. They numbered 420, some from original and others from repeat surveys, but in only 130 of them was any waste of this kind recorded.

In Table T the wastage of calories is shown in terms of the foodstuffs in which it occurred. For tabulation the foods were grouped and arranged in order of the number of households in Scotland and England showing waste of a particular food group.

TABLE T

WASTAGE OF CALORIES IN FOODS

Scotland—Number of households examined . 170
with waste . 59 34·7 per cent
without waste 111 65·3 per cent

England—Number of households examined . 250
with waste . 71 28·4 per cent
without waste 179 71·6 per cent

Foodstuff	*Number of households with waste*	*Population affected*	*Weight of waste: oz.*		*Calorie value of waste*	
			Minimum	*Maximum*	*Total*	*Per head per day for population*
Scotland						
Bread . .	32	188	½ (4) *	59 (6) *	30,233	23
Fat . . .	21	128	½ (8)	11½ (4)	18,242	20
Potatoes .	15	80	1 (5)	54 (7)	3,596	6
Vegetables and fruit	14	92	1 (4)	19 (6)	1,047	2
Meat . .	14	86	½ (6)	8 (7)	3,354	6
Cereal products	11	65	½ (6, 7)	6 (6)	2,723	6
Fish . .	5	26	½ (7)	4½ (5)	513	3
Cheese . .	3	17	½ (5)	4½ (4)	818	7
England						
Meat . .	31	151	½ (3, 3, 4, 6)	19 (4)	10,372	10
Potatoes .	25	134	1 (5)	74 (8)	7,583	8
Bread . .	21	98	½ (3)	35 (4)	12,839	19
Fat . . .	18	83	½ (5, 4)	7 (4)	9,920	17
Vegetables and fruit	9	43	½ (7)	4 (4)	231	1
Fish . .	5	25	1½ (3)	5 (4)	657	4
Cereal products	2	9	1½ (5)	2½ (4)	408	6
Cheese . .	1	4	4 (4)		468	17

* Figures in brackets denote number of persons in the household.

The proportion of households showing wastage of this kind was greater in reputedly thrifty Scotland than in England but as judged by the numbers of households in which it occurred the pattern of wastage differed in the two countries. In terms of actual weight the foodstuff most commonly wasted in Scotland was bread but in England it was meat. In each the greatest loss of calories was in the form of bread.

In Table U the data are summarised in a different manner according to districts and to the number of calories lost per day per head of population in households where wastage was recorded.

TABLE U

NUMBER OF HOUSEHOLDS RECORDING WASTE AND CALORIES WASTED

District	*Classification of Survey*	*Number of households*		*Population in households with waste*	*Calories in waste per day*	
		Without waste	*With waste*		*Total*	*Per head of population*
Scotland						
Aberdeen . .	Original	19	19	119	1,607	14
Dundee . .	Original	31	21	124	3,922	32
	Repeat	28	9	59	910	15
Coaltown of Wemyss	Original	23	6	32	1,268	40
West Wemyss . .	Original	10	4	26	780	30
England						
Wisbech . .	Original	55	21	104	2,624	25
	Repeat	6	1	4	52	13
Fulham . .	Original	37	25	106	1,911	18
	Repeat	7	4	25	331	13
Bethnal Green .	Original	22	6	21	338	11
	Repeat	52	14	90	1,060	12

The weighted means for the loss of energy by the population in the Scottish districts was 24 Cal. and in the English districts 18 Cal.; for the whole Survey it was 21 Cal. per head per day.

Although, as can be seen from Table T, the range of amounts wasted was considerable, it can be concluded that the number of calories lost in this way was small. In this connection the households were not classified according to expenditure groups but, for the whole Survey, the mean energy intake per head per day was 2,260 Cal. It may be said, therefore, that the loss of calories resulting from the wastage of edible material in the households, much of which was probably plate waste, was of the order of 1 per cent of the energy available and that such loss was greater in the Scottish than in the English households.

F. REPEAT SURVEYS

As already mentioned (Section A 4) duplicate surveys were undertaken at eight Scottish and three English centres with the aim of checking the reproducibility of results and examining seasonal variations. They were made at intervals which varied from three to fifteen months after the end of the original enquiries. With the total of 11 centres and with the six

expenditure groups at each the possible number of groups was 66 but 16 groups spread over 10 centres were not represented and, of the 50 which were, 18 consisted of only either one or two households. In only 9 of the groups did the number of families reach double figures.

The data for these repeat surveys were grouped according to the household's expenditure at the time of the repetition of the survey and a comparison with the original investigations could only be made by abstracting the data for these same households from the original groups. This was done and the comparison of the two sets of data was made irrespective of whether or not the family was, at the time of the repeat survey, in the same expenditure group as it had been in the original study. Complete data for these comparisons have not been reproduced and reference is made only to those required for illustrative purposes.

The agreement between repeat and original surveys was tested first by taking those districts in which the effect of season was likely to be at a minimum. For this purpose the three Scottish districts Hopeman, Barthol Chapel, and Dundee sufficed since, in these, the time that had elapsed between the collections of data had been about twelve months. In five of the total of thirteen expenditure groups represented at these centres, however, only single families appeared and for them agreement between repeat and original survey data was found not to be good. This will be seen in the following Table V which gives the data for energy-yielding constituents.

TABLE V

MEAN VALUES FOR ENERGY-YIELDING CONSTITUENTS IN ORIGINAL AND REPEAT SURVEYS WHERE ONLY SINGLE FAMILIES APPEARED IN REPEAT GROUPS

	Hopeman		*Barthol Chapel*						*Dundee*	
	Group IV		*Group IV*		*Group V*		*Group VI*		*Group V*	
	Original	*Repeat*	*Original*	*Repeat*	*Original*	*Repeat*	*Original*	*Repeat*	*Original*	*Repeat*
Calories . . .	1,762	2,104	4,051	3,740	4,018	4,785	4,000	4,876	2,906	2,144
Protein—g. . .	50·1	62·3	119·9	107·5	134·9	151·2	108·4	114·9	70·3	53·4
Carbohydrate—g. .	221·8	258·6	614·4	595·0	602·5	739·4	578·1	618·7	373·0	268·1
Fat—g. . . .	69·5	84·8	111·7	92·5	107·0	121·8	127·7	200·8	117·1	88·8

At Dundee in Group II where, with twenty-three families, the number repeated after about a year was larger, it was found that agreement with the findings for the original surveys was better than in the groups in other districts where only single families occurred. This can be seen by comparing the figures in Table W with those in Table V above.

TABLE W

MEAN VALUES FOR ENERGY-YIELDING CONSTITUENTS IN ORIGINAL AND REPEAT SURVEYS

	Dundee	
	Group II	
	Original	*Repeat*
Calories . . .	1,909	1,914
Protein—g. . .	53·4	50·3
Carbohydrate—g.	294·7	287·0
Fat—g. . . .	51·8	57·1

The intakes per head were calculated only for the groups and not for individual families so that data for the family variations are not available. It is possible that these families in Group II at Dundee had less of a margin for variation than had those in Table U with which they were compared and which were in the higher expenditure Groups IV, V, and VI.

The data for the centres at which the number of families re-investigated exceeded 20 was examined as in Table X irrespective of the time of year at which the repeat survey had been made.

TABLE X

COMPARISON OF DATA YIELDED BY ORIGINAL AND REPEAT SURVEYS WHERE NUMBER OF FAMILIES IN THE GROUP EXCEEDED TWENTY

	Wisbech Group III 22 families		*Dundee Group II 23 families*		*Tarves Group III 24 families*		*Bethnal Green*			
							Group III 25 families		*Group II 63 families*	
	Original	*Repeat*	*Original*	*Repeat*	*Original*	*Repeat*	*Original*	*Repeat*	*Original*	*Repeat*
Calories	2,521	2,593	1,909	1,914	2,659	2,584	2,313	2,247	1,829	1,831
Protein—g.	61·7	64·1	53·4	50·3	77·1	75·7	65·2	63·2	50·7	49·3
Carbohydrate—g.	356·7	362·2	294·7	287·0	404·1	394·7	304·4	295·9	251·1	248·4
Fat—g.	86·6	90·9	51·8	57·1	73·3	70·3	85·7	83·2	63·6	65·6
Calcium—g	0·513	0·418	0·386	0·291	0·961	0·921	0·471	0·386	0·342	0·250
Vitamin A—I.U.	2,320	2,235	1,307	1,392	1,621	1,827	2,830	2,887	2,076	2,099
Vitamin C—mg.	42·0	59·7	23·0	21·8	38·2	36·8	45·7	43·4	36·5	35·8

Here again it will be noted that the results for repeat and original surveys were in general harmony although at three of the centres under examination the families were in Group III where some margin for variation may have existed.

II. THE GROWTH AND HEALTH OF THE CHILD POPULATION

THE plan of the Survey, as described in the Introduction, provided for clinical examinations of children in families whose diets had been surveyed, so that comparisons might be made between assessments of the nutritive value of the family diets and of the health of the children. It was also arranged that some of the families or children at school should receive food supplements for a year following the diet survey and clinical examination, and that the children be re-examined at the end of the period to see whether health had improved. The two sets of data may conveniently be referred to as:

(A) The clinical survey (results of a single examination at the time of the diet survey).

(B) The feeding experiment (comparisons between the results of a first and a second clinical examination, undertaken before and after about one year's extra feeding).

A. THE CLINICAL SURVEY

Three thousand seven hundred and sixty-two subjects, distributed over the age range 0 to 19 years, were examined. Age is defined as age last birthday. Numbers were small below age 2 and above age 14, and the data presented are restricted to children in the age range 2 to 14 years of whom there were 2,761: 1,312 boys and 1,449 girls. Table 28 gives their distribution by district, sex, and food expenditure group, and Table 29 by age, sex, and district. For various reasons, all children in all surveyed families could not be examined, though the attempt was made to include them all. Losses were greatest among infants, adolescents, who were mostly at work after 14, and older school-children.

It may be noted here that the only dietary correlate used in the analysis is food expenditure group. No attempt has been made to relate clinical data to average energy and nutrient consumption by families. The existence of a correlation between a clinical abnormality and food expenditure is not necessarily evidence of dietary causation and the analysis is one of associated trends. Better diet is, by definition (Orr, 1936) associated with better health and better diets are, on the whole, more expensive than the less satisfactory.

1. Method of clinical examination *

Examinations were made by two physicians who worked together in schools or conveniently situated clinics, to which the children were brought. At each centre, conditions were available, in terms of time, space, and equipment, for a careful clinical inspection. The anthropometric apparatus was carried from centre to centre, so that the same measuring instruments were

* The system of clinical data recorded during the survey was based on a pilot study of Aberdeen school-children undertaken by Sir John Orr, Dr. Isabella Leitch, and Mr. W. Godden, in collaboration with Professor E. W. H. Cruickshank and Dr. James Dawson, Aberdeen.

used throughout. Scales were calibrated regularly. The two physicians took pains to arrive at common standards of diagnosis and assessment, by working to an agreed set of definitions, by comparing results following independent examination of the same subjects, and by frequent consultation during the course of the routine work.

The problem of what to look for and what to measure was, and still is, a very difficult one. It was felt that subjective assessments of the general state of nutrition of children would have little value, and the aim was to collect specific measurements and to record the incidence of specific clinical states. Broadly speaking, three kinds of data were collected:

(*a*) Physical measurements.

(*b*) Diagnoses with, where necessary, grading by type and severity of specific clinical signs thought to be related either directly or indirectly to malnutrition.

(*c*) Clinical tests (e.g. estimation of haemoglobin level) thought to indicate general or specific levels of nutrition and health.

A standard routine for the clinical examination of each subject was evolved and results were recorded in a standardised way on a form designed to minimise omissions and errors, and to simplify codification for statistical analysis.

No very useful purpose would be served by describing the technique in detail. Some tests and observations proved to have little value or to be unamenable to uniform assessment. For example, judgments on such qualities as pallor and dryness of the skin were probably so subjective as to be worthless. Posture, included because of the then popularity of Schiøtz's sign, was recorded in photographs, but no technique for their interpretation has been devised. Some clinical observations were found, in the final analysis, to have occurred so rarely that useful statistical analysis in relation to diet was impossible; and, indeed, the accumulated experience of the past fifteen years has shown that yet other observations had no nutritional significance.

The test of Edmund and Clemmesen, first used to measure dark adaptation, was found to be unsound, and an improved technique revealed no disturbance within the range of diets surveyed (Thomson, *et al.*, 1939). The hearing of certain groups of the children was tested by gramophone audiometer as part of a wider study made by Dr. P. M. Tookey Kerridge, and reported briefly by her (Kerridge, *et al.*, 1939). Her untimely death and the destruction of the records made impossible the further account that was to have been prepared for this report. The following extracts are from that publication.

> "The work here described has given numerical expression to the clinical opinion that middle-ear disease is very common among the children of the poorer classes. It is about four times as common, on the average, under poor social conditions as it is under good social conditions; in the poorest places, whether urban or institutional, it may be nearly ten times as common as in a good environment, nearly a quarter of the child population being affected. Climate, housing, and the mixing of children seem to have little effect on the incidence of the disease.
>
> "The children with the highest incidence of defective hearing had diets deficient in many factors, but an increase in the food taken

by two groups of these children for a year did not reduce the incidence of defective hearing.

"The prevention of a disease is a different matter from its cure; not all damaged tissues can be effectively repaired."

Other incidental studies included an investigation of the saturation method of differentiating children with large or small reserves of vitamin C (Pemberton, 1940 a).

The complete records are preserved in the Rowett Research Institute, where they will remain available should further reference to them be thought desirable. Meanwhile, attention will be restricted to a few selected measurements and clinical signs from which results of interest or significance have been derived. Details and definitions will be given with the results.

2. Weight and height

Body weight was measured on a calibrated level balance and recorded to the nearest ounce. Children under 11 were weighed naked and other children wearing only trousers or knickers for which standard deductions were made. Standing height was measured on a portable measuring stand and recorded to the nearest millimetre. The scales were sensitive to 1 oz. over most of the range and the height measuring instrument, on test, gave duplicate measurements agreeing within about 2 millimetres.

Mean values for weight and height at each age in the surveyed population are given in Table 30 and Fig. 1.* These values can be compared with data obtained during 1938 in certain London schools (London County Council, 1940). The London survey covered a much larger number of children than the present Survey, more than 100,000. For the ages at which comparison is possible, namely, 5 to 14 years, Survey children were lighter and shorter. Some of these London children were at central schools but, when the comparison was limited to those attending primary schools, the Survey children were lighter in weight but, in the main, no shorter in stature than were children in London. Fig. 2 gives curves for the weight : height ratios in each case, and shows that the difference was uniform at all ages. The reason is, almost certainly, that Survey children were, as a group, less well nourished than the London children. Poverty was less stringent in London than in many other parts of the country and, furthermore, the Survey was heavily weighted with poor families. Of the children examined 54 per cent were in food expenditure Groups I and II, 47 per cent in Group II alone.

Of more interest are the height and weight data when grouped according to food expenditure. Table 31 and Figs. 3 and 4 give the main data by age, for both sexes combined. Numbers are, at least at older ages, too small to permit useful calculation of means for the sexes separately; and at younger ages the measurements do not differ greatly. To simplify comparisons still further, the data have been grouped in Table 32 in three larger age intervals, and weighted means for each group and for all ages are shown. It will be seen that there is a fairly uniform rise in height and weight as expenditure on food increases. In the London survey an attempt at economic differentiation was made by comparing results from Hampstead, Lewisham, and Wandsworth with those from Bermondsey, Bethnal Green, Finsbury, Shoreditch,

* Appendix 4.

and Stepney. Although measurements at each age were generally slightly greater in the former group than in the latter, it was concluded that " the measurements of some of the better circumstanced boroughs do not differ much from those of the poorer ". Presumably this method did not succeed in differentiating economic conditions very sharply.

3. Cristal Height

Cristal height was taken as the distance between the summit of the iliac crest and the floor, with the child standing, and was measured to the nearest millimetre by tape measure.

The choice of cristal height as the second measure of growth in stature was prompted by general considerations of the change in body proportions which occurs during growth and by the related observation (Hansen, 1932) on Copenhagen school children that taller children had relatively longer legs and were relatively heavier. In that study sitting height was the second measure, but cristal height has the great advantage over sitting height that it is not affected by posture and so is subject to less manipulative error. It is easily measured in children.

Other evidence and theoretical reasons for believing a high ratio of cristal to total height to reflect relatively mature development and to be associated with good health have been reviewed by Leitch (1951). It was thought that a table to show mean total heights and cristal heights at each age, and the difference between the two, which gives a rough indication of trunk length, would be useful. To save laborious retabulation, mean cristal heights were calculated from the mean ratios given in Table 30. The results are given in Table 33.

Cristal height : total height ratios by age and food expenditure group are given in Tables 31 and 32, and in Fig. 5. It is clear that as food expenditure rises the contributions of leg length (cristal height) to total height increases. It was of interest to examine which of the three measures, weight, height, or cristal height, shown to increase with food expenditure, could be used most effectively to differentiate between food expenditure groups (taken as a measure of nutritional status). This problem was investigated by Mr. M. H. Quenouille, who prepared the following report:

> " The ability of the measurements, height, cristal height and weight to discriminate between expenditure groups was tested. It was found that cristal height was consistently more efficient than total height, and, for all children under 12 years of age, better than weight. Height was also found to be more efficient than weight for the youngest children. This is illustrated by the following table in which the information given

Age	*Height*	*Cristal Height*	*Weight*
	per cent	*per cent*	*per cent*
2—4	77	91	29
4—6	93	99	48
6—8	92	100	64
8—10	87	89	90
10—12	75	91	74
12—14	83	83	96

by each measurement used singly is expressed as a percentage of the information given by all three together.

To illustrate the matter in terms of actual measurements, two tables are given below. The first of these shows that height discriminates both between age and expenditure groups.

Mean Heights in cm.

Age Group Years	*Group I–II*	*Group III*	*Group IV*	*Group V–VI*
3—	101·7	103·3	104·2	108·8
6—	120·2	121·7	122·7	126·6
10—	140·0	142·0	143·4	147·1

If cristal height were supplying no further information about the expenditure groups the ratio cristal height: total height would be constant within each age group. As the table shows, the ratio increases, and this increase is a measure of the additional discrimination supplied by cristal height."

Mean Cristal Height : Total Height Ratios

Age Group Years	*Group I–II*	*Group III*	*Group IV*	*Group V–VI*
3—	0·547	0·553	0·553	0·558
6—	0·575	0·579	0·578	0·578
10—	0·596	0·601	0·598	0·605

4. Biacromial breadth

Average results for this measure, the distance between the external margins of the acromion processes when the subject is seated on a chair with hands on knees and muscles relaxed, are given in Tables 30 to 32 and in Figs. 1 and 5. Clearly, biacromial breadth also increases with food expenditure.

5. Haemoglobin

The Haldane method of estimation was used on samples of blood obtained by pricking the ear after mild stimulation of the lobe by cleaning with ether. Measured amounts of blood were placed in tubes containing 0·5 ml. diluting fluid, and after being gassed * and sealed, the tubes were sent daily to the Rowett Institute where haemoglobin estimations were made under standard conditions, most of them by one observer. The standard used for colour comparisons was calibrated at the National Physical Laboratory to a value of 100 per cent = 14·8 g. Hb per 100 ml. blood.

Tables 34 and 35 and Fig. 6 give the mean results by sex and age, while Fig. 7 gives Survey results in comparison with those obtained by the Medical Research Council's Committee on Haemoglobin Surveys (1945). The data in Table 34 make it clear that there is little or no difference between mean

* A cylinder of carbon monoxide gas was carried for use in premises where coal gas was not available.

haemoglobin levels obtained in the several food expenditure groups. The numbers in expenditure Groups V and VI are, however, small and may not indicate reliably the prevalent levels among children brought up in comfortable economic circumstances. For this reason, it is difficult to come to any conclusion as to the incidence of anaemia in the population studied. This same difficulty was experienced by the M.R.C. Committee in interpreting the results of its wartime study. In it the numbers of children examined were similar to those of the Survey, 1,439 and 1,343 boys, and 1,526 and 1,036 girls, respectively, and the subjects were said to be drawn from a population widely representative of economic circumstances. Wartime economic circumstances were, however, very different and generally better, at least among the working classes, than pre-war ; and it has already been noted that children in the Survey came mainly from the poorer groups of the population. The agreement between its results and those of the M.R.C. (Fig. 7) is therefore of interest. Among boys, they are almost identical; among girls, the wartime study yielded results slightly lower except at ages 5 to 8. It seems safe to conclude that the haemoglobin levels of school-children do not change significantly with changing economic and nutritional circumstances, at least within the range of circumstances which this country experienced just before and during the 1939-45 war.

6. Clinical observations

Data for fourteen conditions are presented in Tables 36 to 39. For most of these there were big differences between sexes and by age. When the data had been subdivided to show these differences the numbers were so small that it was impossible to show differences by food expenditure groups. For that reason crude rates by sex and for four expenditure groupings are presented.

Chronic upper respiratory catarrh. This meant chronic catarrhal inflammation of the respiratory passages above the larynx; for this the fauces and external nares were examined. The diagnosis was recorded only if there was a history of chronicity. The condition was considered to be present among 15·1 per cent of the boys and 10·4 per cent of the girls. In each sex the condition became less common as age increased. Ignoring age differences, there was some evidence that the incidence fell as food expenditure rose. The slight rise of incidence which occurred in expenditure Groups V and VI may have been due to chance.

Bronchitis. This was diagnosed if râles and/or rhonchi were present on ausculation, and was found in 11·3 per cent of boys and 8·3 per cent of girls. As the results by sex, age, and expenditure group are of special interest, a complete breakdown of the data has been prepared (Table 39). Taking all expenditure groups together, the incidence fell from 17·7 per cent among boys aged under 5 to 4·2 per cent among those over 10; the equivalent figures for girls were 14·0 and 3·0 per cent. For each sex and age group there was a fairly regular decline as food expenditure rose. The trend by expenditure group was particularly marked among the youngest children. Among the clinical signs this was the only marked trend with food expenditure after allowing for age. It is not known whether it had any significant relation to nutrition.

Knock knee. Measurement was made, using external callipers, of the distance between the internal malleoli of the ankles when the child was sitting on the floor with the knees extended and touching and while he or she was attempting to approximate the ankles. Care was taken to guard against internal rotation of the legs. Measurements of less than 1 cm. were disregarded, and greater measurements were taken as diagnostic of knock knee. In the tabulations measurements between 1 and 4 cm. and of more than 4 cm. are differentiated. The severer degree of knock knee was relatively rare and little can be made of the figures. Knock knee of some degree was present in about one-third of the children with little or no sex difference. It was somewhat less at ages above 10 than at younger ages. There is little evidence of any difference by food expenditure.

Flat foot. A permanent record of footprints for both feet was obtained by sprinkling chalk powder with a powder puff on a piece of black art paper and allowing the child to stand on it. When surplus chalk was blown off imprints of the feet remained and were fixed by spraying with artist's fixing varnish. Lines numbered 1 and 2 were drawn from the posterior extremity of the heel mark to the tips of the great and middle toes and the imprint graded as 1, 2, or 3 according to whether the instep edge did not cut line 1 or did cut line 1 or lines 1 and 2. For purposes of tabulation flat foot has been diagnosed on the basis of grade 1 records, i.e. where the instep edge did not cut a straight line between the heel and the tip of the great toe. Flat foot was considered present if recorded on one or both of the feet. The condition was present in 8·6 per cent of both boys and girls; it declined from between 25 and 30 per cent among children under five to 5 per cent or less among children aged 5 or over. There was no evidence of any relation to food expenditure.

Skeletal deformities. Three conditions were looked for:

(*a*) Frontal bossing. Diagnosed only if definite and if each frontal bone was separately bossed.

(*b*) Harrison's sulcus. For the examination arms were raised above the head to stretch the pectoral muscles.

(*c*) Pigeon chest. Diagnosed only if definite.

These conditions were diagnosed, respectively, in 9·6, 8·1 and 4·0 per cent of boys, and in 6·4, 5·4 and 2·8 per cent of girls. Frontal bossing and Harrison's sulcus appeared to decline and pigeon chest to increase with age. Relations to food expenditure grouping are slight and of questionable validity.

Pyogenic infections of the skin. These included pimples, furuncles, carbuncles, impetigo, and septic wounds or abrasions. They were present in 8·2 per cent of boys and 5·5 per cent of girls. The incidence increased with age among boys, but declined among girls up to 10 to 15 years, after which there was an increase. Among boys, the incidence declined as food expenditure increased; a gradient was less consistent and less steep among girls.

Dry skin. This was diagnosed by touch, and was obviously a matter of subjective impression. It was recorded, therefore, only when the clinician

considered it to be present in marked degree. This was so in 19·6 per cent of boys and 17·9 per cent of girls. The incidence was greatest in the age group 5 to 10 years, and tended to fall as food expenditure increased.

Follicular eruption. This was a papular eruption of the hair follicles on the lateral aspects of the arms, legs, and buttocks and also, occasionally, over the scapular regions, flanks and abdomen. The papules were conical, about the size of a pin's head, and contained a horny projecting spine. The eruption was non-irritating, was seldom infected and imparted an impression of roughness when the hand was drawn across it. It was diagnosed as present when it occurred in at least two areas and when at least six papillae were obvious per sq. cm. in one of these.* The condition was observed in 25·7 per cent of boys and 20·4 per cent of girls. Its incidence increased with age and appeared to have no relation to food expenditure.

Eye infections. Blepharitis was observed in slightly less than 3 per cent of children. The sex incidence was similar and there was no evidence of any consistent change with age. The incidence declined as food expenditure rose. Styes (hordeola) were much less common, but their incidence varied in much the same way as that of blepharitis.

Otitis media. This was diagnosed by auriscopic examination and recorded as otorrhoea or perforation of the drum without otorrhoea. The presence of wax if in sufficient quantity to conceal the drum was noted. Incidence is shown as the percentage of children affected, regardless of whether one ear was involved, or both. On these criteria, otitis media was present in 4·9 per cent of boys and 4·2 per cent of girls. There was no clear evidence of a gradient either by age or by food expenditure.

Mouth signs. Gingivitis was diagnosed in 4·3 per cent of boys and 2·6 per cent of girls. Its incidence rose with age and was notably high in the age group 10 to 15. Angular stomatitis, one or more inflamed fissures radiating from the corners of the mouth usually surrounded by a zone of hyperaemia and sometimes covered with dried exudate, was present in about 1·6 per cent of children, irrespective of sex. There was no clear indication of change with age or food expenditure.

7. Teeth

Dental data were recorded as dictated by the clinician who inspected teeth in a good light with the aid of a mirror and probe. Deciduous teeth were recorded, in each quadrant, as A, B, C, D, and E, starting with the central incisors, and presence or absence was indicated. Permanent teeth in each quadrant were numbered 1 to 8. The third permanent molar had seldom erupted in the age groups with which this report is concerned, so permanent teeth numbered 8 are not included in the tables. Caries was noted and classified by degree into three grades on the system laid down in the M.R.C.'s Special Report No. 191 (Mellanby, 1934). It was diagnosed visually or by definite penetration and sticking of the probe. The presence

* This condition was thought to be follicular hyperkeratosis of a milder degree than that which has been described in tropical areas as a sign of vitamin A deficiency. Some doubt as to the validity of this view supervened and a less specific designation came to be preferred. Pemberton (1940b) has described the condition as seen in the Survey and has given an account of its histology.

of fillings was also recorded. From the raw data, it was intended to obtain information, not only as to the number and kind of teeth present, but also as to the extent of caries, taking into account the degree of caries in each tooth. Much thought was given to the calculation of average caries figures, each of which possessed some inherent disadvantage, but in the end it was decided that analysis of dental data should be limited to consideration of the number of teeth present, the number decayed, to whatever degree, and the number filled. Decisions as to whether missing teeth had not erupted, had been shed, or had been extracted were avoided; but consideration of the numbers of specific teeth present at a given age would often allow correct interpretation of the data in this respect.

The data are summarised in Table 40, grouped according to age and food expenditure on a basis slightly different from that used for previous tables. The total number of children for whom information is available is 3,159, but 56·2 per cent came from families in which food expenditure was less than 4s. per head per week. Dental differences between food expenditure groups were slight, and, since the number of cases in some groups was very small, it was difficult to draw conclusions. Between the ages of 6 and 8 there was some slight indication of earlier eruption of permanent teeth among the children from families who spent most on food; but there was no such differentiation at later ages nor in regard to the eruption of deciduous teeth. There was no indication that the incidence of decayed teeth varied according to food expenditure group. The incidence of filled teeth, not unexpectedly, rose with food expenditure, since families with more money to spend on food are likely to spend more on dental treatment. The numbers of permanent teeth present per child in each expenditure group were similar, suggesting that extractions were not much more common in one expenditure group than in another. Such differences as existed indicated that extractions, like fillings, were more common among the well-to-do (see, for example, data for the permanent molars at age 12–13). On the whole, it seemed that the combined incidence of decayed, missing and filled teeth (DMF rate) was much the same at each age in all expenditure groups.

This general conclusion is supported by dental data obtained from Gordonstoun School where the pupils were mainly from well-to-do families and where the diet was excellent. The data are not given here but DMF rates at least as high as those for children from the poorest families were found. Dental caries in the Gordonstoun pupils had, of course, been efficiently treated by conservative methods.

B. THE FEEDING EXPERIMENT

It was realised that even if a certain body measurement and the incidence of certain clinical conditions could be shown to be related to the level of family expenditure on food, this would not necessarily be evidence that the trends had a nutritional basis. It was therefore planned to conduct a feeding experiment and to determine, by comparison with similar observations in control groups, which measurements and clinical states had responded.

Experimental feeding was arranged at five centres. At three of these, Wisbech, Tarves, and West Wemyss, food was given to children at school, and at the two others, Bethnal Green and Dundee, it was sent for consumption in the homes. Where school feeding was adopted this dictated that the

children in attendance be allocated to the fed group. Controls were chosen from a nearby district, usually attenders at another similar school. Where home feeding was adopted fed and control families were chosen from those already surveyed in the districts concerned, with special reference to the number of children in each family and the likelihood of residence at the same address for the following year. There was no attempt at accurate matching of fed and control families, but neither was there any conscious bias and, in each experimental area, the groups were broadly similar.

In the school feeding groups dietary supplements were planned to make good the main deficiencies revealed by the diet survey in that area. Where food was delivered to the home, it was similarly intended to make good the main defects in the diet of each particular family; that is to say, the nutrients most needed were to be supplied. In practice, of course, the actual level of supplementation obtained by children was subject to many uncontrollable influences. Where the school meal system permitted a choice children might take less or more than the specified supplement. While food delivered to homes was intended for the children, there was no means of ensuring that it was not shared among the adults also, or indeed that it was actually consumed by the household. As will be shown, however, the effect on growth indicates that the food did reach its intended destination.

Accurate records were kept of quantities of extra food passing into consumption, but for the above reasons there is no means of determining the additional nutrients actually consumed by individual children. The following notes describe the arrangements at each centre.

Tarves

Soup was prepared on 220 school days between 22nd November, 1937 and 9th December, 1938, and the amounts of ingredients were recorded. It was taken on almost all occasions by nearly all of the pupils for, in a total of 42,267 attendances, it was refused at only 185. Milk was also provided in the standard bottles of one-third pint and there is no record of any child not having had one bottle daily; on 5,500 occasions a second and on 175 a third was also drunk. Each pupil had two halibut liver (H.L.) oil capsules weekly providing 16,000 I.U. vitamin A. Some pre-school children received supplementary feeding in the form of one pint of milk per day and three capsules of halibut liver oil and three oranges per week. Control children were examined in the schools at Methlick and Barthol Chapel only a few miles away.

Wisbech

At this centre feeding was at one school and control subjects were chosen from the neighbouring district of Parson Drove. Soup was provided on 197 of the school days between 2nd August, 1938 and 16th June, 1939. The number of attendances by children in the scheme was 24,054 and at 16,755 of these soup was taken. Single bottles of milk were consumed 20,756 times but, on 10,349 occasions an extra bottle was drunk so that, in effect, much of the information which was derived from the experiment at this centre referred to children who were having two-thirds pint of milk when at school. Oranges and halibut liver oil capsules were provided at weekly intervals and the total attendances on these days numbered 5,099. Oranges to the number of 5,928 were eaten by children whose attendances numbered 4,458

which is equivalent to about 1⅓ orange per pupil weekly. When available the capsules were given at the rate of two per pupil on these same weekly occasions but supplies were irregular and none was provided on sixteen of the forty-two weeks; during the whole period 5,344 were consumed by pupils whose attendances numbered 2,698.

West Wemyss

The arrangements at this centre were that larger amounts of milk should be given and two half-pints per pupil were supplied daily in one of which ½ oz. marmite was dissolved. The period of feeding was from 15th June, 1938 to 31st March, 1939, and, in the final analysis, data were available for sixty-three pupils who had this supplementary feeding. The control pupils were attending school at Coaltown of Wemyss not far distant.

Bethnal Green and Dundee

At these two centres where supplementary foods were supplied to selected homes, families were chosen from each of the expenditure Groups I to IV and the following Table Y shows their distribution among these groups and the numbers of adults and children up to 17 years of age in them.

TABLE Y

NUMBER AND COMPOSITION OF HOUSEHOLDS RECEIVING FOOD AT BETHNAL GREEN AND DUNDEE

Expenditure Group	*Bethnal Green*			*Dundee*		
	Households	*Adults*	*Children*	*Households*	*Adults*	*Children*
I	9	30	47	2	4	14
II	24	66	117	13	30	69
III	12	37	44	1	4	5
IV	2	10	10	—	—	—

In each area the feeding was continued over about forty-one weeks and the total weekly amounts of food which were supplied and the average per household per week were as shown below, Table Z.

TABLE Z

WEEKLY SUPPLIES TO HOUSEHOLDS RECEIVING FOOD AT BETHNAL GREEN AND DUNDEE

Foodstuff		*Bethnal Green*		*Dundee*	
Name	*Unit*	*Total*	*Per household*	*Total*	*Per household*
Milk	pint	1,793	38·2	469	29·3
Cheese	lb.	169	3·6	46	2·9
Bemax	oz.	416	8·9	240	15·0
Marmite	oz.	352	7·5	88	5·5
Oranges	number	1,833	39·0	396	24·8
H.L. Oil Capsules	number	402	8·6	224	14·0
C.L. Oil Emulsion	oz.	small amount	—	40	2·5
Malt and C.L. Oil Emulsion	oz.	small amount	—	—	—
Eggs	number	—	—	370	23·1
Blackcurrant Puree	oz.	small amount	—	—	—

Populations studied

In the analysis of results, it was necessary to discard all children examined only once. Complete data for clinical examinations before and after the experimental period of approximately one year are available for 552 fed and 474 control children. Their distributions by sex, age, and food expenditure group are shown in Table 41. It will be seen that numbers in the higher expenditure groups were very small and that there were scarcely any children in the youngest and oldest age classes. Within each sex and food expenditure group the age distributions are broadly comparable, but the very small numbers in each cell as well as the relatively small total number makes comparison difficult.

Table 42 gives the numbers in the fed and control groups by sex, food, expenditure group and district, but the small numbers prevent any useful comparison by district.

Weight and height

Table 43 gives starting weights and heights and increments during the experimental period by experimental group and age, and Table 44 gives the same data by experimental group and food expenditure group (all ages combined). The increments are shown graphically in Figs. 8 and 9.

The amount of weight gained during the experimental period increased with age, but at all ages except 3 years the fed group gained appreciably more than the control. When the data were grouped by food expenditure, fed children in all groups gained more than controls, except in Group VI, where expenditure was greatest. On each basis, the exceptions to the general rule are probably fortuitous and due to smallness in numbers. It is, however, of interest to note that the difference between the weight gains by fed and control subjects narrowed progressively as food expenditure rose, i.e. it looks as though those initially worst fed showed the greatest response to extra feeding.

As regards increase in height, fed children at all ages and in all expenditure groups gained more than the controls and there is no clear evidence that the increment was less as food expenditure rose.

With the small numbers available in the feeding experiment the findings for growth in cristal height were not as definite as in the clinical survey and the data for this and for biacromial breadth are not presented here.

Clinical signs

It might have been predicted with some confidence, from the results of animal experiments alone, that growth would be accelerated by improved feeding, but clinical signs are affected by so many outside influences, not known to have any direct effect on growth, that the same degree of confidence could not be felt. Further, preliminary summaries of the clinical findings showed that, with the numbers examined already small and divided by sex and age, it was difficult to show relations to food expenditure. With the much smaller numbers in the feeding experiment no clear clinical result could be expected unless there had been some sign specific for some diet defect which was corrected by the extra food. No such sign was found and analysis has been confined to the incidence of bronchitis, the one sign which

has been shown to vary with food expenditure and within age groups. Table 45 gives the results.

The most striking feature of the data which show, in general, the expected gradients with age and food expenditure, is that the incidence of bronchitis was considerably less at the second examination in both the fed and the control groups, there being little difference between the two in this respect. There is therefore no evidence that the extra feeding had any effect. Whether the decreased incidence in both groups was due to a real change or to a change in the standard of diagnosis cannot be determined. Some decline would of course have been expected, since all children were a year older at the second examination. It was also probable that the incidence of bronchitis would have changed in response to climatic variations, and might have differed from year to year, even at the same season. Data for temperature and humidity at the five nearest meteorological recording centres and at the relevant times gave no support to this idea.

From these studies of children examined once, to give a rough cross-section of the child population, and of others re-examined again after a year's extra feeding, the only clear measure of health appears to be growth. The significant measures of growth are height, cristal height, and weight.

III. THE SURVEY IN RETROSPECT

THOUGH the Rowett Institute had the experience of the 1926-27 milk-in-schools experiment and the methods of all previous work of this kind had been studied it was realised that this Carnegie study was on a scale that had never before been attempted and that it would be wise to get all available advice.

It was begun only after those responsible for it had had the benefit of the best available advice and promises of assistance which were fulfilled at every stage of the enquiry.

The most difficult part was the clinical definition of signs of deficiency disease. Some of the methods such as extensive X-ray examination of bones had to be abandoned as unsatisfactory or impracticable. In the fifteen years which have elapsed since the work was done new and improved methods have been evolved in the light of which some of the methods used in this pioneer experiment may now seem out of date.

It has been said that the Survey was a pioneer effort. Though the diet survey technique was not new it had never been applied on such a large scale. Many technical problems such as those of assessing and classifying levels of family food expenditure and per heading the results had to be tackled almost *de novo* as the older techniques proved to be misleading. In 1937 there were only the recommendations of the League of Nations Technical Commission as to what constituted a good diet, with some scattered information in the literature on requirements of nutrients and energy. The Rowett Research Institute standards were therefore devised to give a working instrument, based on the best available information, against which the diet survey results could be tested.

The clinical survey was started without any real precedent and the procedure, while deriving from the results of a few growth studies and some clinical investigations, arose in the main in a pure spirit of enquiry. The late 1930s were the heyday of allegedly specific criteria and tests for the diagnosis of deficiency states in man. Nowadays we are less confident. That some of the observations proved to have little value in diagnosing levels of nutrition is regrettable but not surprising. Yet many have an interest in themselves. It is doubtful if the finding that more than 4 per cent of the children examined had running ears or perforated ear drums could have been forecast. It would be interesting to have precise confirmation of the impression that the incidence is much lower among the children of today.

It is perhaps to be regretted that more use has not been made of the data for analyses like that of the energy supply made by Quenouille (1950). But this requires great expertise in the use of statistical methods. So far, we have Quenouille's report on methods only, none on the results obtained, although we have been informed that the results tend to show that, in the poorest families, food purchases do not keep pace with the growth of the family in number and age.

The feeding experiment was improvised somewhat crudely and with little regard to the detailed statistical and other points of design which might nowadays be considered very important. In its rough realism it resembled

life rather than the laboratory and may be none the worse for that. Definite effects on growth of extra feeding were demonstrated, a fact which is the more important because this kind of direct demonstration on human beings is uncommon.

For all these reasons the results of the Survey have more than merely historical interest. The relationships between food and health and the social evils which lead to poor nutrition are still of fundamental importance. Food habits in this country have undergone a revolution since the Survey was made and the increased consumption of milk and of vitamins made possible by the cheap milk and other welfare schemes will have done much to remedy the shortage of calcium and vitamin A which the Survey showed to have existed. The end of food rationing may mean that income will again become one of the chief determinants of levels of nutrition. The national health, and especially the health of children, has greatly improved, but there is still a social gradient in health; indeed, the gradient may be as steep as it was before the war, though at a more favourable level. Any investigation into modern conditions and relationships of food, health, and income would have much to learn from the Carnegie Survey by profiting not only from its mistakes but also from the boldness and simplicity of the concepts on which it was based.

SUMMARY

The objects of the investigation were:

(1) To find out the kind of diet in families of different income groups in rural and urban districts in representative parts of the United Kingdom.

(2) To try to determine any correlation which might exist between diet and health.

(3) To give supplementary foods to a number of families most of whom were living on the poorest diets with comparable families as controls to determine the extent to which health and physique could be improved by improving the diet.

Dietary and clinical surveys were made in sixteen districts of the United Kingdom in the years 1937 to 1939. The families selected for study were those with children. They numbered 1,352, with 7,920 persons of whom 3,067 were adults, 556 adolescents and 4,297 children. They were chosen as representative of the economic conditions prevailing at the time.

For the dietary survey, records were made in the homes under the supervision of trained recorders and the amount of money spent on food per head for the families was the basis of their classification in six expenditure groups.

Foods were arranged in thirty-four groups and the total amounts of energy and of ten nutrients which they were providing for the groups were calculated. For an assessment of the adequacy of the diets the amounts of these nutrients which were being provided per head of the populations in the groups were compared with needs assessed on two independent standards. One was prepared in the Rowett Research Institute while the Survey was in progress and the other was from the Report of the Committee on Nutrition

of the British Medical Association published in 1950. In each case comparison was between nutrients supplied and the standard was an exact one since these recommended allowances were computed with due regard to the numbers in the groups, the type of work in which adults and adolescents were engaged, the occurrence of pregnancy and lactation among women and the needs for growth according to age of the children.

In order to provide checks on these studies the surveys were repeated at eleven of the centres in approximately one in four of the households. The data so obtained were assembled according to the same system and for comparison the findings for these same households were abstracted from the original surveys. Losses by wastage of edible food were also studied.

From the dietary survey it was found that, as expenditure on foodstuffs increased, the quantities of milk, cheese, butter, meat, green vegetables, fruit, and sugar which were used generally rose. This meant that the percentage of protein derived from animal sources rose overall from 36 to 57 per cent of the total protein. The amounts of cereal products did not increase with expenditure on food.

In terms of nutrients the findings were similar whichever standard was used except for vitamin C for which, in mode of assessment, the two standards differed fundamentally. In calories the average diet fell short of requirements in the lower expenditure groups; the associated shortage in total protein was more widespread and affected families further up the scale of expenditure; in calcium, vitamin A and vitamin C shortage was almost universal occurring in all but the groups of families in which expenditure on food was greatest.

At the same time as the dietary survey was in progress clinical examinations of the children were being made. Two clinicians, between whom there was close collaboration, followed a routine system of examination. The information recorded was *physical:* measurement of weight, height, cristal height, and biacromial breadth; *clinical:* records of a large number of signs considered to be related either directly or indirectly to malnutrition, and *biochemical:* estimations thought to be indicative of general or specific levels of nutrition and health.

Mean values were calculated for the physical measurements according to age of the child and to the expenditure group to which its family belonged and, where possible, they have been compared with data obtained at the same time by the London County Council for children in schools under its care.

The clinical abnormalities recorded did not lend themselves as readily as did physical measurements to statistical analysis. Some were almost entirely matters of subjective judgment and, in the light of later research, even of doubtful validity as criteria of malnutrition: others referred to conditions the incidence of which was so small as to render them of little significance. Bronchitis and chronic upper respiratory catarrh appeared in their incidence to be related both to the age of the child and to the expenditure groups of its family. There was no evidence of anaemia as measured by the level of haemoglobin in the blood. From examination of teeth there was some slight indication of earlier eruption of permanent molars in the higher groups than in the lower; the numbers of decayed teeth present were not related to the amount of money being spent on food.

On the basis of the findings from the dietary survey a feeding experiment was made at five of the centres. With the aim of improving the diets of the

children foods, which were additional to those being provided in the homes, were given at three of the centres in the form of school meals, and, at the two others, as additions to the household supplies, sent to the homes for consumption there by children. After periods of nearly a year the effects produced on the health and development of the children were assessed by a repetition of the clinical examination. Weight and height measurements of these children in comparison with similar data for children who had received no extra food showed that growth had been accelerated. The clinical examinations failed to detect a measurable difference between the groups with and without supplementary foods.

In a final section the Survey findings are considered in retrospect. There are appendices to the Report. The first is a discussion by one of the clinicians of dietary standards as criteria of deficiencies in the food supplies of a population; the second is on the expression of results of dietary surveys; the third gives in full the data on the basis of which this Report to the Carnegie United Kingdom Trust has been prepared.

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APPENDIX 1

DIETARY STANDARDS AS CRITERIA OF DEFICIENCY

By A. M. THOMSON

1. Introduction

The field work of the Carnegie Survey and the analysis of the resulting data gave rise to much discussion of procedures and principles, for there were, and still are, only few and partial precedents to serve as guides. Some of the enquiries and conclusions which arose from the experience gained in it have already been published. Leitch has reviewed the evolution of dietary standards (1942) and, with Aitken, the techniques of diet survey (1950). More recently, Thomson and Duncan (1954) have surveyed human malnutrition from the point of view of clinical diagnosis in the absence of frank deficiency disease. There is no need to cover this ground here, but there is room for a discussion of the interpretation of diet survey data in relation to standards of dietary requirements. The Carnegie material is a good text around which to build such a discussion, because diets were tested, on the one hand against the health of the surveyed child population and on the other against two independent requirement standards. Examples to be cited will illustrate general principles and should be read in that light. For instance, differences between the Rowett Research Institute standard and the British Medical Association recommended allowance for a given nutrient exemplify differences between standards in general. It is not the intention to argue that one is right and the other wrong.

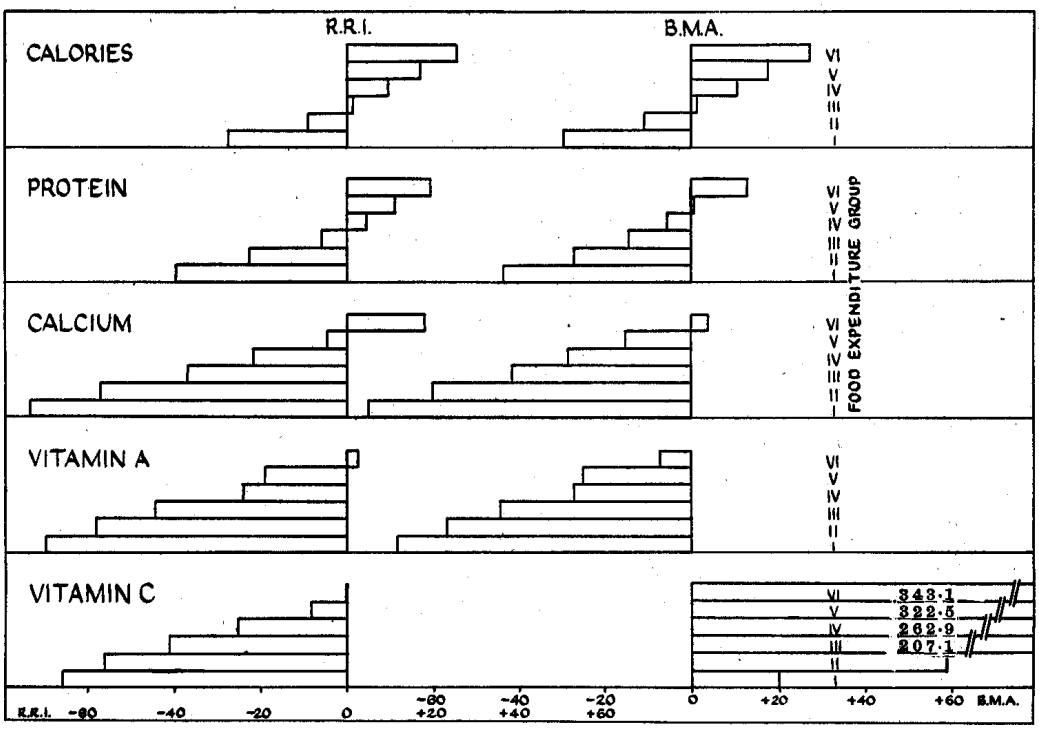
2. Similarities and differences between standards

Examination of the figure below and the related Table 27 shows that the Rowett Research Institute and the British Medical Association standards yield broadly similar results, except for vitamin C. The more detailed data in Tables 15–26 generally support this finding.

A superficial conclusion might be that two quite independent assessments of human dietary needs, the one made in 1937-38 and the other ten years later, were for all practical purposes similar, with the unfortunate exception of vitamin C, for which the earlier assessment had been much too lavish.

Such a conclusion would not be wholly justified. The two tables of requirements are in fact generally similar in relation to calories, protein, and calcium though they vary in detail. The Rowett Research Institute standard for vitamin B_1 is almost exactly 50 per cent higher than the B.M.A. recommendation, so that on the basis of the latter the Survey results would be considered much more satisfactory than on the former. The agreement between the results for vitamin A is fortuitous, since the standards are different. In the absence of any detailed physiological guides the Rowett Research Institute standard specified a flat allowance of 4,000 I.U. whereas the B.M.A. standard varies from 8,000 I.U. for lactating women to 3,000 I.U. for children

under 14 years of age. Clearly, close agreement between standards would be obtained only if, as was the case in the Carnegie Survey, the population contained a high proportion of children.



Percentage deviation of intakes from Rowett Research Institute (R.R.I.) and British Medical Association (B.M.A.) standards

The vitamin C results have no point of contact. On the Rowett Research Institute basis, intake as a percentage of requirement ranged from 34 to 100; on the B.M.A. basis from 120 to no less than 343. The older Rowett Research Institute standard might be dismissed as obsolete, but the 1948 recommendations of the U.S. National Research Council would give similar results. The explanation is set out below (p. 72).

3. Deficits and excesses

If the standard adopted is physiological, i.e. represents a level below which some impairment of health may be expected, then those groups whose intake falls much short of requirements should show evidence of the appropriate health defects. Conversely, groups that habitually consume amounts grossly in excess of requirements *might* show some clinical evidence of this. Truly excessive consumption of calories would, for example, tend to produce obesity. Leaving vitamins C and B_1 out of consideration for the moment we note that both standards agree in showing that there is, on the average, a deficit of calories in expenditure Groups I and II, of protein in Groups I, II, and III, and of calcium and vitamin A in all except Group VI. Some of the deficiencies are large, and some of the excesses scarcely less remarkable.

Calories. Intake as a percentage of requirement was of the order of 60 in Barrow and Bethnal Green Group I according to both standards, and in

Fulham Group I by the B.M.A. standard. Yet the clinical data did not show the children of these families to be semi-starved.

At the other end of the scale, the three rural Aberdeenshire areas were obviously exceptional. Although no expenditure group showed a deficit, and the excesses reached about 50 per cent in Barthol Chapel Group V, the clinical evidence there did not point to the existence of gluttony. It is, of course, possible that the standards themselves have been wrongly applied in these areas as agricultural work was classified as medium, whereas it should perhaps have been taken as heavy. Again the rural children often had to walk long distances to school and so may have expended more than the average amount of energy. If these three areas be excluded as obviously atypical, we find large excesses of energy intake in certain areas among Group V and VI families. The clinical data do not give any support to the suggestion that the children of these families were over-fed.

Protein. As would be expected the findings for protein are similar to those for calories. No clinical criteria of protein deficiency or excess are available. The impression given by the data that protein deficiency was more widespread than calorie deficiency is due to the relatively high proportion of large families with many children in the lower income groups. Both standards prescribe for children a relatively high proportion of calories from protein.

Calcium. Taking the surveyed population as a whole, results obtained with each standard agree that all expenditure groups except VI showed more or less serious deficiencies. In Groups I and II the average intake was less than half the average requirement. As with energy and protein, the data for calcium from the three Aberdeenshire rural areas were atypical in that requirements were met or almost met in all expenditure groups; in the higher expenditure groups there were large excesses. In other areas, all Scottish Group VI averages except in West Wemyss reached the targets; among English Group VI families, on the other hand, the Rowett Research Institute target was reached only in Barrow and Wisbech and the B.M.A. target in Wisbech.

Of course, excess or deficit depends not only on absolute intake but on the age distribution of a group. Thus, Dundee Groups V and VI, fourteen families, sixty-seven persons, had an average intake about 0·72 g. daily, amounting to about 120 per cent of Rowett Research Institute requirements and about 100 per cent of B.M.A. requirements; whereas Fulham Groups V and VI, thirty-seven families, 129 persons, had a higher average intake, 0·84 g. daily, which met only about 92 per cent of Rowett Research Institute and 82 per cent of B.M.A. requirements.

On both bases, Group I families in all areas except Dundee were obtaining less than 30 per cent of their assessed needs, and in Group II families the percentages in all areas except rural Aberdeenshire were below 40 on the Rowett Research Institute basis, and mostly below 40 on the B.M.A. basis. Despite these apparently large deficiencies, it has not been possible to draw attention to any clinical criteria indicating calcium deficiency specifically. Clinical rickets was not seen or reported among the children of the surveyed families and the occurrence of skeletal deformities bore no clear relationship to food expenditure.

Vitamin A. Once again, both standards agree in indicating large deficiencies although, as has already been stated, this agreement is to some extent fortuitous.

On neither standard did any average intake for Groups I or II reach 50 per cent of requirements except at Bethnal Green. In Groups V and VI the percentages ranged from 54 to 140 on the Rowett Research Institute basis and from 49 to 117 on the B.M.A. basis. No specific evidence of vitamin A deficiency was found in the clinical survey, although the groups with the lowest intakes were obtaining only about 1,000 I.U. per head per day. In particular, there was no evidence of impaired dark adaptation and no improvement on giving halibut liver oil.

4. The effects of deficiencies

Despite the absence of specific clinical criteria which could be related to deficient intakes of individual nutrients, there is no doubt that a high proportion of the children seen were malnourished, i.e. were clinically in " a poor state of nutrition ". To this extent the comparisons of diets with the dietary standards are, as a whole, in no way misleading.

The somatometric data show clearly that the worst fed children were lighter and shorter, had shorter legs and were less broad in the shoulders than the better-fed children. That these findings indicate dietary deficiency is proved by the accelerated growth among fed children in the feeding experiment. Furthermore, the examining physicians were in no doubt that the ill-grown children in the poorer groups were less healthy than were the better-grown children from the better-fed groups. That this clinical impression was not reducible to statistical form, is not a valid argument against its reliability or its importance.

Thomson and Duncan's review (1954) shows that, despite the growth of an enormous literature since the Survey was made, we are still without diagnostic criteria of specific deficiency states short of frank deficiency disease; indeed, it is suggested that *specific* " sub-clinical " criteria may not exist and that the prodromata of deficiencies are non-specific and similar and may arise from underfeeding or from any one of a number of deficiencies. On some such basis, the results of the Survey begin to make sense. In it we had a population in which frank deficiency disease was rare, but in which generalised malnutrition was undoubtedly widespread, manifested by imponderable but evident impairment of health and vitality and by easily measured defects of growth and form. Dietary deficiency was therefore undoubtedly confirmed in a general sense by clinical impressions and by body measurements.

Deficiencies in diet may be of energy, of structural materials, or of materials necessary for intermediary conversions. It can scarcely be doubted that parts of the Survey population suffered from deficiency of structural materials, especially of protein and calcium, and that these deficiencies resulted in restriction of growth. On the other hand, since impairment of growth, associated with general impairment of health and vitality, was the only clinical evidence of poor nutrition, there is no satisfactory indication that deficiencies existed other than those to which the body could adapt itself by economy of utilisation. The limits of such adjustment would, of course, be shown by the appearance of frank deficiency disease, but that was not seen.

When supplies of a structural material such as calcium are limited, the

growing body meets this deficiency by economy of utilisation and by slowing of development of bone, and such limitations may be accompanied by changes of form and by impairment of general health and vitality. When body size is restricted, and when the metabolic turnover is slowed down so that a given supply goes further, the requirements of the affected individuals are reduced. Thus, for example, a small and relatively inert child will have relatively low energy needs. His needs will only become normal if and when he grows to normal size and expends normal amounts of energy.

The effect of this situation on average ratios of intake to requirement is not difficult to see. Requirement figures are average figures, relating to hypothetical average children who are in good health, and such children should be taking about 100 per cent of their requirements. Smaller and less healthy children may be found to be taking, say, 60 per cent of the same requirements, but the deficiency in relation to *their own* needs, as dictated by size and rate of growth, is probably less. A " 40 per cent deficiency " in terms of diet will have only a relative and not an absolute meaning. This does not imply that it is meaningless. The small child may not be realising its potential for growth and real evidence of accelerated growth and improved health as a result of better diet supports this idea.

" Hypothetical average children in good health " may be postulated in different ways at different times. Since the Survey the growth and health of most British children have changed greatly for the better and standards of size, health, and energy expenditure, which dictate the need for food energy and structural materials, may well, at the present time, be higher than even so-called optimum standards of fifteen years ago. We can never know the full potential until it has been attained, and therefore all standards are to some extent pragmatic.

5. The nature and basis of dietary requirements

The foregoing illustrations from the Survey serve to underline a number of fundamental truths about the concept of requirement standards. The multiplicity of these and the volume of argument about their respective merits can be explained in part by a failure on the part of both proposers and users to appreciate clearly their nature and basis.

Broadly, there are two kinds of dietary standards:

(1) *Physiological standards.* These give levels of intake below which impairment of health may be expected and originate from observations relating intakes of energy or specific nutrients to impairment of growth, function, or structure. Thus, if it is accepted that 10 mg. ascorbic acid daily is a representative minimum protective dose against scurvy in adults, the requirement of ascorbic acid for adults is 10 mg. daily. To supply only this minimum might be dangerous in practice; it is usual to increase the physiological values by an arbitrary margin of safety; but the basis remains physiological.

In the experimental work from which physiological values are usually derived, the amounts represent quantities actually taken. Theoretically it is possible to adjust them to represent levels as provided, e.g. by adding allowances to cover losses of vitamin C in the preparation and cooking of food. A simpler procedure is to use standards derived directly from observations on foods " as purchased ".

(2) *Social standards.* Here no direct assumptions are made about the intimate relations to health of the level of intake of nutrients. The procedure is to measure the diets of people who are observed to be healthy, and to make the justifiable assumption that these diets will maintain other people in equally good health. The standards so derived are both empirical and practical because ordinary people actually eat these diets and no exotic pattern of consumption is implied. Furthermore, since the standards are derived from observations on normal diets, it is usual to measure the nutritive value of foods as purchased, and so diet survey data and the standards which are applied to them are strictly comparable.

Standards of this kind are, obviously, perfectly valid as social targets provided they are derived from a population broadly similar to that to which they are to be applied. A standard derived from the diet of a healthy Western population may well be difficult to apply and may even be misleading if used for an Oriental population habitually eating a very different kind of diet. This is no handicap. Even physiological standards can be applied with certainty only to populations similar in kind to those from which they are derived. If, through changes in health or in patterns of consumption, the standard adopted for any given population becomes outmoded, then new standards ought to be devised and adopted. In biology, there are few absolutes. The amendment of dietary standards with changing circumstances, e.g. rate of growth, is just as rational and necessary as is the adjustment of standards for rations of cows if selective breeding increases their milk yield.

Such considerations throw a good deal of light upon the interpretation of standards. For example, the B.M.A. recommended allowance of vitamin C is a physiological standard. " The Committee is of opinion that, while 20 mg. a day or even less may be an adequate quantity (to prevent scurvy) for adults, 30 mg. daily would provide a good margin of safety." The amount of 30 mg. represents *intake*, and it might be wrong to assume that the margin of safety provides for losses of vitamin C during preparation and cooking of food. Even so, the gross excesses found when the Survey data for the vitamin C content of the edible portion of the food purchased were compared with the B.M.A. allowance may be unduly large. The Rowett Research Institute standard, on the other hand, was a social target intended to be compared directly with " as purchased " diet survey data. The comparison, which indicates widespread deficiency, means simply that most groups were not consuming as much vitamin C as families judged to be in generally good health. The comparison with the B.M.A. standard, indicating universal excesses, means that all families were taking much more vitamin C than was necessary to prevent scurvy.

The case of vitamin B_1 may be used to illustrate some of the difficulties brought about by interrelationships between the requirement of a given nutrient and the composition of the diet as a whole. The Rowett Research Institute standard specifies that the vitamin B_1 requirement is 0·6 mg. per 1,000 total Calories *required.* Consumption of vitamin B_1 is therefore related to a theoretical energy figure. Yet it might be argued that the requirement for any given group should be related, not to the theoretical energy requirement of a well-grown and healthy population of like sex, age, and occupation, but to the energy value of the diet actually eaten by the population under consideration.

APPENDIX 1

The following table gives the English data for vitamin B_1 calculated on actual calorie intakes and of calorie needs assessed on the Rowett Research Institute basis:

Expenditure Group	*Calories*		*Vitamin B_1*			
	Intake	*Requirement*	*Intake*		*Per cent of R.R.I. requirement, on basis of*	
			mg.	*mg./1,000 Cal.*	*Cal. intake*	*Cal. requirement*
I	1,483	2,100	0·57	0·38	63	·47
II	1,891	2,129	0·73	0·39	65	59
III	2,341	2,288	0·96	0·41	68	72
IV	2,660	2,443	1·20	0·45	75	84
V	2,950	2,513	1·39	0·47	78	93
VI	3,228	2,647	1·65	0·51	85	106

These figures show that the vitamin B_1 intake increases only from 0·38 to 0·51 mg. per 1,000 Cal. as one moves up the food expenditure scale. The Rowett Research Institute standard, which is perhaps unnecessarily high, though easily attained on diets containing high extraction bread or oatmeal, makes the assumption that 0·6 mg. per 1,000 Cal. is necessary for health. If the requirement is calculated on the calories actually taken, intakes range from 63 to 85 per cent of need. If the more usual procedure of calculating on the basis of calories required is adopted, the intake gradient becomes considerably more steep, from 47 to 106 per cent. This is obviously because the poorer groups took calories in deficit of assessed need, while some of the higher groups apparently ate more than they needed. If the B.M.A. basis were adopted, 0·4 mg. per 1,000 Cal. instead of 0·6, the percentages would all shift, with no change of gradient with food expenditure.

There is no question here of right and wrong procedures. The standards are relative and the procedures are arbitrary; one is entitled to use any reference point which seems most useful and realistic and any method of calculation. The important thing is to know what the resulting ratios mean, so that they can be properly interpreted.

Estimates of energy need are, in general, derived from studies of the metabolism and work of normal persons, and are adjusted to fit hypothetical persons of ideal or average body size. Thus, for example, the B.M.A. Committee worked out the needs of an adult male 168·5 cm. tall and weighing 65 kg., by adding to an estimate of basal metabolism plus specific dynamic action allowances for general activity and for work output. The U.S. National Research Council (1948) recommendation refers to a standard man weighing 70 kg. of unstated height. These are, more or less, physiological estimates. On the other hand, the B.M.A. derives its recommendation for children from " figures relating to age and sex from a smooth curve based on data taken from the literature and from a considerable quantity of unpublished records of food consumption of *well-nourished, healthy* children " (italics not in the original). This procedure for children gives, of course, a social rather than a physiological standard. But whatever the nature of the data, they have been derived from a healthy, well-grown, normal population.

When standards obtained in this way are applied to diet records obtained from an ill-grown and less healthy population, one is not surprised to find

that a deficiency exists. But a deficiency does *not* necessarily mean that the persons concerned felt hungry. In point of fact, the poorer groups of the Survey population did not complain of hunger. Few had difficulty in satisfying their appetites; they ate the amount called for by their metabolism and their activity, and this was considerably less than the amounts which would be eaten by an ideal population, without unemployment. Indeed, if the persons suffering from energy deficits had been given and had eaten diets calculated to be ideal in quantity, gastro-intestinal discomfort might well have resulted.

Conversely, the existence of calculated excesses of energy intake may have been due to erroneous assumptions regarding energy expenditure on work, and in any case do not necessarily signify over-feeding and obesity. Excesses in the healthiest classes may mean that the standards adopted were a little low; which is very likely, since the growth of children has been accelerating in Britain for about half a century, and the standards may have lagged behind even when they were proposed.

Dietary standards of many kinds have been propounded with varying weights of authority behind them. They sometimes differ remarkably in some respects, e.g. in relation to vitamin C, but there is a substantial amount of agreement. The discrepancies could be reduced by adoption of common concepts; or if different concepts were made plain, arguments about validity would be less burdensome.

Our knowledge of nutritional physiology is still very scanty and, while this is so, there is a strong case for deriving dietary standards straightforwardly from diets commonly eaten by healthy peoples and for recognising their *ad hoc* nature. It might then become common practice to say that, for example, 50 per cent of a surveyed population ate diets whose nutritive value was less than that of diets consumed by the healthiest group. This is much more correct than to say that 50 per cent of the surveyed population was inadequately nourished, with the implication that half the people were malnourished.

The only defect of an *ad hoc* social target is that it does not tell us sensitively and exactly what will happen if, through war or import restrictions, it becomes impossible to adhere to the standard. In this case, the only thing to do is to examine a lower standard in terms of the health of groups already living at such levels and in terms of what we know about physiological needs. If this is done with due care, major catastrophes should be avoided entirely, and probable effects on growth rates and general levels of health should be capable of assessment with a fair degree of accuracy.

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APPENDIX 2

Extracts from " Technique and Interpretation of Dietary Surveys " by I. Leitch and F. C. Aitken (1950). *Nutrit. Absts. and Revs.*, **19,** 507.

The Number of Consumers

All meals at home, no visitors

The simplest case is where the family has all its meals at home and has no visitor. The total intake may then be compared directly with the estimate of total needs.

Visitors

If there have been casual visitors, and if no extra food has been bought for them, it is permissible to ignore them, although this is seldom done. If there have been visitors and extra food has been bought, then the visitors must be included as consumers. This is usually done by assessing approximately, from the foods and menus, the habitual distribution of food over the day and assessing what fraction of a day's food the visitors' meals represent. Suppose there were two visitors for lunch on one day, and lunch represents about one-third of the day's energy intake, then the total number of consumer days for the week is increased by two-thirds of a consumer-day.

Meals out

If individual members of the family have meals out, then it must first be decided whether the information required is what the home diet was, or an estimate of what the total diet may have been. This is a question of first-class importance and failure to appreciate the implications of different procedures has given, and still gives, rise to a great deal of confusion and error.

When information on the home diet only is desired, total intake is simply compared with assessed requirement and the result will show that the family obtained, from its home diet, this or that percentage of its assessed needs. This also has seldom been done in the past. The habit has been to estimate total intake, as described in the next paragraph, but with the recent expansion and encouragement of outside eating the question of correct procedure assumes a new importance. So long as the meals taken outside are few and occasional, the error involved in the conventional assessment will probably be insignificant, but when one meal or more is regularly taken out on working days, the error of certain procedures may be considerable.

The procedure that was almost universal until recently was this. Suppose we have a family of 4 persons and the period of survey is 1 week, giving a normal total of 28 consumer-days if all had eaten at home all the time. Suppose further that 1 person was absent from dinner on 3 days and that dinner, as part of the family diet, is valued at $\frac{1}{3}$ of the day's food. Then the number of consumer days is 27. The value of food purchased by the family expressed in calories or grams of any constituent, is multiplied by 28/27 to give the total which, it is assumed, would have been bought if the missing member had been at home. This method involves the assumptions that

(1) more food would have been bought, not that those at home would have consumed less, and (2) all foods would have been increased in like proportion. Neither assumption is necessarily correct. It would be better to ask whether less food was bought in view of the absences and, if no change was made in usual purchases, to ignore the absences. If less food was bought, then the limitations of this assessment should be remembered. The error, either way, will not be great when the absences are few.

Since, then, the first method involves the assumption that, if the home supply is short, outside meals will be short too, and the second the equally undesirable assumptions that outside meals are dictated by daily requirement irrespective of home supply, and that the chosen fraction of requirement is procured, it would be better to abandon both. The best procedure would be to record (1) what the home diet provides, (2) the assessed needs, (3) what the meals taken outside are stated to be and what they might reasonably be expected to provide, and (4) if there is still a deficit, why more or better outside meals are not procured.

The Expression of Results

Per head

So far, we have considered both intake and requirement in terms of totals, for the week or for the day. But this gives quantities of energy or nutrients which are difficult to grasp and impossible to understand except in reference to the family. When the results for groups of families are summarised, the difficulty is still greater, since the total may be millions of calories.

For this reason a convention has been adopted by which both intake and requirement are expressed per head of the consumers. This is a simple and straightforward expression; it gives the answer in quantities of an order familiar to everyone, and provided requirement is simultaneously assessed and intake and requirement are shown side by side, it is not open to any misinterpretation. The final answer may be best expressed in the form: intake as a percentage of requirement.

It has been suggested that the lactating woman and breast-fed baby should receive special treatment; that, when the requirement of a lactating woman is allowed for and the baby receives no separate allowance, the baby should be omitted from the count of consumers. A simple example will show this to be wrong. Suppose a family of four with the following Calorie requirements: father 3,000, lactating woman 3,000, child 1,000 and breast-fed baby already provided for. Total needs: 7,000 Cal. daily, or per head, including the baby, 1,750 Cal. Now suppose the baby to be weaned. The list of needs becomes 3,000, 2,200, 1,000 and 600 Cal. daily, giving a total of 6,800, or 1,700 Cal. per head. That is to say, the total and per head requirements are slightly reduced, as they should be, and by about the correct amount, because the energetic efficiency of production of breast milk is of the order of 60 per cent. There is a reduction of 50 Cal. in requirement per head. But if the original total had been divided by only 3, the requirement per head would have been 2,333 Cal. and, at weaning, there would be an apparent reduction of 633 Cal. per head, which is absurd. This does not affect the individual family comparison of consumption and requirement, but if a population of such families were divided into two groups, on the basis of breast feeding and artificial feeding, it would give an artificial difference between the requirements of the two of over 600 Cal. per head daily instead of 50 Cal., and, if

consumption and requirement were approximately equal, a similar apparent difference in consumption, which would be false.

The requirement of the artificially fed baby has also been the subject of some argument. If the tabulation of needs is to be literally correct, the weight of the baby must be known and allowance made accordingly. On the other hand, it may be fairly claimed that the baby ought to be breast fed up to 6 months of age and that it is correct to estimate requirement on that basis. In practice this is the simpler device, to reckon as lactating all mothers of infants up to 6 months old.

Per man-value

The above method is to be preferred to the old man-value basis for several reasons. The chief argument against man-value scales was, at one time that they were applicable only to energy, but that can easily be remedied, and indeed similar scales have been proposed and used for other nutrients. The chief error of the man-value system is that the reference unit, as the system was applied to family diets, depends on the total food intake and is not a fixed unit.

Take, as illustration, a family of four, the man being assessed as 1 and the wife and children, say, at 0·8, 0·4, and 0·3, giving a total of 2·5. Then if the total daily food consumption is 6,200 Cal. the intake is said to be 2,480 Cal. per man-value; if the total food consumption is 7,500, the intake per man-value is 3,000. It follows by implication that in the first case the intakes of wife and children are, 1,984, 992 and 744 and in the second 2,400, 1,200 and 900 Cal. In short, this method implies that the child of a miner requires more food than a child of the same sex and age whose father is a clerk! But, in fact, the consumption (and needs) may vary only in respect of the man's share, and the women's and children's shares and needs may be identical, e.g. in the above example, wife 2,200, children 940 and 720, with a residue in the first case of 2,340 for a sedentary man and in the other of 3,640 for a medium heavy worker.

Per " nutrition unit "

On the other hand, it is possible to make use of a modification of this method for some purposes if the unit of requirement is fixed (so-called " nutrition unit ") and the individual requirement is expressed as a multiple or fraction of that unit. For instance, the Bureau of Home Economics of the United States Department of Agriculture (H. K. Stiebeling, *et al.*, 1941, *U.S. Dept. Agric. Misc. Publ.*, No. 405, 373) for energy uses the unit 3,000 Cal. and expresses the requirement of an individual in a family as a multiple or fraction of 3,000. This device is used for direct comparison of the intakes per " nutrition unit " in different families or groups. The same device was used (E. M. Widdowson, 1947, *Med. Res. Counc. Spec. Rep. Series*, No. 257, H.M.S.O.) in preparing Table XXXIX in the report on children's diets. The net effect is the same as with the percentage of requirement method outlined above.

APPENDIX 3

Index to Tables

DIETARY SURVEY

Table

1. Dates of collection of data.
2. Families and persons according to districts.
3. Proportion of adults, adolescents, and children in families according to districts.
4. Persons according to age, sex, and district.
5. Persons according to age, expenditure group, and sex.
6. Families and persons according to expenditure group and district.
7. Scotland: foodstuffs: amount per head per week in districts.
8. England : foodstuffs: amount per head per week in districts.
9. Scotland: foodstuffs: amount per head per week.
10. England: foodstuffs: amount per head per week.
11. All districts: foodstuffs: amount per head per week.
12. Scotland: nutrients: amount per head per week in districts.
13. England: nutrients: amount per head per week in districts.
14. Scotland, England, and all districts: nutrients: amount per head per week.
15. Calories: comparison for districts: Rowett Institute standard.
16. Total protein: comparison for districts: Rowett Institute standard.
17. Total protein: percentage of total calories from protein.
18. Calcium: comparison for districts: Rowett Institute standard.
19. Vitamin B_1: comparison for districts: Rowett Institute standard.
20. Vitamin A: comparison for districts: Rowett Institute standard.
21. Vitamin C: comparison for districts: Rowett Institute standard.
22. Calories: comparison for districts: B.M.A. standard.
23. Total protein: comparison for districts: B.M.A. standard.
24. Calcium: comparison for districts: B.M.A. standard.
25. Vitamin A: comparison for districts: B.M.A. standard.
26. Vitamin C: comparison for districts: B.M.A. standard.
27. Scotland, England and all districts: nutrients as percentages of standards: Rowett Institute and B.M.A. standards.

CLINICAL SURVEY

Table

28. Children: according to sex, expenditure group, and district.
29. Children: according to sex, age, and district.
30. Body measurements: according to sex and age.
31. Body measurements: according to age and expenditure group.
32. Body measurements: according to expenditure group with grouping of ages.
33. Cristal height: calculated mean for age.
34. Haemoglobin: according to sex, expenditure group, and age.

35. Haemoglobin: according to sex and age.
36. Clinical abnormalities: according to sex.
37. Clinical abnormalities: according to age and sex.
38. Clinical abnormalities: according to expenditure group and sex.
39. Bronchitis: according to sex, age, and expenditure group.
40. Teeth: according to expenditure group, age, and condition.

FEEDING EXPERIMENT

Table

41. Children: according to expenditure group, sex, and age.
42. Children: according to sex, expenditure group, and district.
43. Weight and height: initial values and gains: according to age.
44. Weight and height: initial values and gains: according to expenditure group.
45. Bronchitis: according to expenditure group and sex at beginning and end of experiment.

TABLE 1

DATES OF SURVEYS

District	*Original Surveys*			*Repeat Surveys*	
	1937	1938	1939	1938	1939
Scotland					
Aberdeen	Feb.-April			June-July	
Kintore	Oct.				
Hopeman	Oct.			Dec.	
Barthol Chapel	July-Sept.			July-Aug.	
Methlick	July-Sept.			Nov.	
Tarves	May-July			Nov.	
West Wemyss		Jan.-Mar.		Sept.	
Coaltown of Wemyss		Feb.-Mar.		Sept.	
Dundee	Nov.-	Jan.		Oct.	
Edinburgh			Mar.-April		
England					
Barrow		Aug.-Oct.			
Liverpool		Aug.-Oct.			
Yorks, West Riding			Feb.-March		
Wisbech		April-June		Nov.-Dec.	
Fulham		June-Aug.			Jan.
Bethnal Green		Mar.-June		Oct.-Dec.	

APPENDIX 3

TABLE 2

DIETARY SURVEY

Population : Numbers of Families and Persons according to Districts

(*a*) Original Surveys

District	*Number of families*	*Total population*	*Number of adults over 18 years*	*Number of adolescents 14-17 years*	*Number of children under 14 years*
Scotland					
Aberdeen	37	233	88	31	114
Kintore	6	49	15	4	30
Hopeman	27	139	45	8	86
Barthol Chapel	35	170	80	6	84
Methlick	38	211	105	14	92
Tarves	105	633	276	35	322
West Wemyss	56	321	129	29	163
Coaltown of Wemyss	42	225	96	16	113
Dundee	99	583	223	36	324
Edinburgh	50	398	111	32	255
Total—Scotland	495	2,962	1,168	211	1,583
England					
Barrow	100	606	222	57	327
Liverpool	103	703	225	48	430
Yorkshire	103	537	213	20	304
Wisbech	162	880	367	66	447
Fulham	103	497	231	41	225
Bethnal Green	286	1,735	641	113	981
Total—England	857	4,958	1,899	345	2,714
Total—All districts	1,352	7,920	3,067	556	4,297

	Number per family			
	Persons	*Adults*	*Adolescents*	*Children*
Scotland	5·98	2·36	0·43	3·20
England	5·79	2·22	0·40	3·17
All districts	5·86	2·27	0·41	3·18

TABLE 2 (*cont.*)

DIETARY SURVEY

Population : Numbers of Families and Persons according to Districts

(*b*) Repeat Surveys

District	*Number of families*	*Total population*	*Number of adults over 18 years*	*Number of adolescents 14-17 years*	*Number of children under 14 years*
Scotland					
Aberdeen	14	81	31	6	44
Kintore	—	—	—	—	—
Hopeman	17	100	34	4	62
Barthol Chapel	16	84	37	3	44
Methlick	18	93	44	8	41
Tarves	46	276	127	11	138
West Wemyss	13	71	28	4	39
Coaltown of Wemyss	10	48	20	3	25
Dundee	38	288	88	24	176
Edinburgh	—	—	—	—	—
Total—Scotland	172	1,041	409	63	569
England					
Barrow	—	—	—	—	—
Liverpool	—	—	—	—	—
Yorkshire	—	—	—	—	—
Wisbech	61	322	135	21	166
Fulham	16	97	35	7	55
Bethnal Green	112	773	240	74	459
Total—England	189	1,192	410	102	680
Total—All districts	361	2,233	819	165	1,249

	Number per family			
	Persons	*Adults*	*Adolescents*	*Children*
Scotland	6·05	2·38	0·37	3·31
England	6·31	2·17	0·54	3·60
All districts	6·19	2·27	0·46	3·46

TABLE 3

DIETARY SURVEY

Population : Proportion of Adults, Adolescents and Children in Families according to Districts

(*a*) Original Surveys

District	*Adults over 18 years*	*Adolescents 14-17 years*	*Children under 14 years*
Scotland			
Aberdeen	0·378	0·133	0·489
Kintore	0·306	0·082	0·612
Hopeman	0·324	0·058	0·619
Barthol Chapel	0·471	0·035	0·494
Methlick	0·498	0·066	0·436
Tarves	0·436	0·055	0·509
West Wemyss	0·402	0·090	0·508
Coaltown of Wemyss	0·427	0·071	0·502
Dundee	0·383	0·062	0·556
Edinburgh	0·279	0·080	0·641
Scotland	0·394	0·071	0·534
England			
Barrow	0·366	0·094	0·540
Liverpool	0·320	0·068	0·612
Yorkshire	0·397	0·037	0·566
Wisbech	0·417	0·075	0·508
Fulham	0·465	0·082	0·453
Bethnal Green	0·369	0·065	0·565
England	0·383	0·070	0·547
All districts	0·387	0·070	0·543

(*b*) Repeat Surveys

District	*Adults over 18 years*	*Adolescents 14-17 years*	*Children under 14 years*
Scotland			
Aberdeen	0·383	0·074	0·543
Kintore	—	—	—
Hopeman	0·340	0·040	0·620
Barthol Chapel	0·440	0·036	0·524
Methlick	0·473	0·086	0·441
Tarves	0·460	0·040	0·500
West Wemyss	0·394	0·056	0·549
Coaltown of Wemyss	0·417	0·063	0·521
Dundee	0·306	0·083	0·611
Edinburgh	—	—	—
Scotland	0·393	0·061	0·547
England			
Barrow	—	—	—
Liverpool	—	—	—
Yorkshire	—	—	—
Wisbech	0·419	0·065	0·516
Fulham	0·361	0·072	0·567
Bethnal Green	0·310	0·096	0·594
England	0·344	0·086	0·570
All districts	0·367	0·074	0·559

TABLE 4

DIETARY SURVEY

Population: Numbers of Persons according to Age, Sex, and District

(*a*) Original Surveys

District	*Sex*	*Years*																			
		18+	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	*Total*
Aberdeen . .	M	44	2	3	3	4	4	1	5	6	6	5	6	5	3	6	7	2	4	4	120
	F	44	5	5	1	3	3	4	7	3	6	6	1	5	2	4	3	8	1	2	113
Kintore . .	M	9	1	1	1	—	1	1	—	2	—	3	3	1	3	1	2	1	—	—	30
	F	6	—	1	—	1	1	1	2	2	—	2	2	—	—	—	1	—	—	—	19
Hopeman . .	M	16	5	3	3	2	5	4	5	3	6	—	6	3	1	2	2	1	1	1	69
	F	29	2	4	3	6	4	3	2	2	2	1	1	5	2	1	—	1	1	1	70
Barthol Chapel	M	39	3	1	2	1	2	3	6	3	3	4	2	4	1	1	2	2	—	1	80
	F	41	1	5	3	3	2	5	2	4	3	5	2	3	6	4	—	—	1	—	90
Methlick . .	M	52	1	1	1	3	4	4	2	8	5	8	1	3	3	2	3	3	2	1	107
	F	53	2	2	2	1	2	4	4	6	2	3	5	3	5	5	3	1	—	1	104
Tarves . . .	M	139	6	6	7	7	14	15	14	18	14	12	7	18	10	12	9	5	3	1	317
	F	137	6	4	10	12	11	6	21	8	16	12	17	11	11	17	7	3	3	4	316
West Wemyss .	M	68	2	6	5	3	8	6	11	9	6	10	3	6	9	6	3	7	4	2	174
	F	61	5	—	2	5	5	7	4	9	8	7	6	7	6	2	4	2	3	4	147
Coaltown of Wemyss	M	49	3	3	2	3	2	2	3	6	4	4	6	9	5	4	5	2	4	3	119
	F	47	2	—	3	1	2	1	4	7	7	5	11	4	5	5	—	1	—	1	106
Dundee . .	M	105	10	11	12	6	10	16	10	21	9	10	5	8	7	10	6	4	5	4	269
	F	118	16	8	17	13	14	21	12	15	12	12	13	7	13	6	5	4	5	3	314
Edinburgh . .	M	57	8	8	17	9	4	14	8	15	8	10	7	5	7	7	5	5	4	2	200
	F	54	9	10	10	5	12	8	8	14	5	12	8	12	8	7	5	2	4	5	198
Scotland . .	M	578	41	43	53	38	54	66	64	91	61	66	46	62	49	51	44	32	27	19	1,485
	F	590	48	39	51	50	56	60	66	70	61	65	66	57	58	51	28	22	18	21	1,477
Barrow . .	M	105	9	7	10	13	12	11	12	11	7	12	9	7	11	6	6	6	8	9	271
	F	117	15	9	12	13	9	7	23	19	10	16	15	8	16	18	16	5	4	3	335
Liverpool . .	M	107	26	17	10	18	17	14	14	12	9	20	9	10	11	9	8	6	4	6	327
	F	118	40	14	18	20	16	16	17	15	13	14	12	13	17	9	7	9	5	3	376
Yorkshire . .	M	105	36	26	10	14	11	9	10	5	4	9	6	6	2	4	2	2	1	2	264
	F	108	22	21	9	12	9	15	14	10	9	10	5	8	3	5	5	3	4	1	273
Wisbech . .	M	183	10	11	10	13	17	18	13	14	24	18	20	12	15	14	15	11	8	6	432
	F	184	11	18	11	17	15	19	24	22	15	21	23	15	14	13	4	10	6	6	448
Fulham . .	M	114	11	15	5	11	3	8	11	6	6	3	6	12	5	7	4	4	5	4	240
	F	117	10	15	8	9	8	10	5	8	5	10	8	7	4	9	11	8	2	3	257
Bethnal Green.	M	316	53	44	39	31	38	37	32	30	39	36	31	29	19	22	19	11	11	7	844
	F	325	46	45	48	50	39	35	27	40	30	31	29	29	24	28	23	19	14	9	891
England . .	M	930	145	120	84	100	98	97	92	78	89	98	81	76	63	62	54	40	37	34	2,378
	F	969	144	122	106	121	96	102	110	114	82	102	92	80	78	82	66	54	35	25	2,580
All districts .	M	1,508	186	163	137	138	152	163	156	169	150	164	127	138	112	113	98	72	64	53	3,863
	F	1,559	192	161	157	171	152	162	176	184	143	167	158	137	136	133	94	76	53	46	4,057

TABLE 4 (*cont.*)

DIETARY SURVEY

Population: Numbers of Persons according to Age, Sex, and District

(*b*) Repeat Surveys

District	*Sex*	*Years*																			*Total*
		18+	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Aberdeen .	M	12	—	1	2	2	1	—	—	2	2	4	1	2	2	2	1	2	1	—	37
	F	19	1	3	2	2	1	2	3	2	2	4	1	—	—	—	—	1	1	—	44
Kintore .	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hopeman .	M	14	2	4	2	2	3	3	3	1	4	3	—	5	3	—	2	1	—	—	52
	F	20	2	1	3	3	2	2	2	2	1	2	—	2	3	2	—	1	—	—	48
Barthol Chapel	M	18	1	1	—	—	1	—	1	7	—	3	2	3	2	1	—	—	—	1	41
	F	19	1	—	2	2	1	—	3	—	3	2	3	1	3	1	1	1	—	—	43
Methlick .	M	21	1	—	2	1	1	3	1	1	3	2	5	3	—	—	2	2	—	1	49
	F	23	—	—	1	1	1	—	1	4	2	1	2	2	1	2	2	—	1	—	44
Tarves . .	M	64	1	4	4	1	3	9	8	4	9	4	8	5	3	4	1	2	—	1	135
	F	63	3	1	1	3	8	9	2	8	5	5	7	5	8	6	3	2	1	1	141
West Wemyss	M	13	1	1	1	1	3	3	2	2	3	1	2	1	1	1	2	—	2	—	40
	F	15	3	1	1	1	—	2	1	2	2	2	—	—	1	—	—	—	—	—	31
Coaltown of Wemyss	M	10	—	1	—	1	—	—	1	—	1	1	—	2	4	1	1	1	—	1	25
	F	10	1	—	1	1	1	—	1	—	1	2	3	1	—	1	—	—	—	—	23
Dundee .	M	44	3	3	7	3	4	6	4	7	11	8	7	4	5	5	4	4	4	1	134
	F	44	6	6	4	9	5	6	14	6	8	9	6	7	4	9	5	1	3	2	154
Edinburgh .	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Scotland .	M	196	9	15	18	11	16	24	20	24	33	26	25	25	20	14	13	12	7	5	513
	F	213	17	12	15	22	19	21	27	24	24	27	22	18	20	21	11	6	6	3	528
Barrow .	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Liverpool .	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Yorkshire .	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Wisbech .	M	68	2	5	6	3	8	6	2	6	5	11	8	4	5	5	5	6	3	—	158
	F	67	1	3	4	7	5	5	8	6	6	9	13	8	7	8	1	2	3	1	164
Fulham .	M	18	—	1	7	1	4	3	4	4	2	2	—	2	2	2	3	1	—	1	57
	F	17	1	—	1	—	2	4	2	1	2	—	4	2	1	1	1	1	—	—	40
Bethnal Green	M	110	12	20	15	10	13	18	18	20	18	21	18	18	9	10	11	10	6	5	362
	F	130	14	14	19	22	19	15	17	14	15	23	15	23	14	15	14	10	13	5	411
England .	M	196	14	26	28	14	25	27	24	30	25	34	26	24	16	17	19	17	9	6	577
	F	214	16	17	24	29	26	24	27	21	23	32	32	33	22	24	16	13	16	6	615
All districts	M	392	23	41	46	25	41	51	44	54	58	60	51	49	36	31	32	29	16	11	1,090
	F	427	33	29	39	51	45	45	54	45	47	59	55	50	42	45	27	19	22	9	1,143

TABLE 5

DIETARY SURVEY

Population: Numbers of Persons according to Age, Expenditure Group, and Sex in Scotland and England

(*a*) Original Surveys

District	*Group*	*Years*																			*Pregnant*	*Lactating*
		18+	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Scotland	*I*	12	2	1	3	3	2	4	2	5	1	2	3	—	3	3	1	1	1	—	—	—
	II	180	21	28	35	22	23	30	26	39	35	28	17	28	18	19	17	8	7	7	—	—
	III	155	15	8	11	7	18	16	23	27	16	21	15	17	12	19	13	14	11	7	—	—
Males	*IV*	115	2	2	2	3	8	8	6	7	3	8	7	10	5	6	12	3	2	3	—	—
	V	69	1	4	2	1	2	5	4	7	4	4	2	6	7	3	1	5	5	1	—	—
	VI	47	—	—	—	2	1	3	3	6	2	3	2	1	4	1	—	1	1	1	—	—
Total .		578	41	43	53	38	54	66	64	91	61	66	46	62	49	51	44	32	27	19	—	—
	I	11	3	5	4	—	3	3	3	5	2	3	3	1	1	2	1	—	—	—	1	—
	II	155	32	20	33	29	34	31	32	29	25	38	24	23	22	21	13	6	4	6	6	17
Females .	*III*	158	5	8	13	14	14	18	17	15	17	14	18	22	19	16	7	8	6	5	2	6
	IV	102	5	3	1	5	5	7	11	10	9	7	8	9	11	4	4	3	6	7	—	—
	V	67	2	3	—	1	—	1	2	7	5	1	3	1	3	4	2	2	—	1	—	2
	VI	63	1	—	—	1	—	—	1	4	3	2	10	1	2	4	1	3	2	2	—	—
Total .		556	48	39	51	50	56	60	66	70	61	65	66	57	58	51	28	22	18	21	9	25
England	*I*	53	11	3	13	9	14	11	9	5	10	9	8	14	5	12	6	1	3	1	—	—
	II	372	78	68	40	54	54	62	51	43	40	43	43	32	31	29	23	16	13	15	—	—
Males	*III*	243	39	35	21	25	21	19	24	21	26	28	15	15	18	12	12	12	10	11	—	—
	IV	136	11	8	8	7	7	5	7	7	9	11	11	9	6	3	10	6	8	2	—	—
	V	66	4	4	1	3	1	—	1	1	3	4	1	3	2	3	1	4	2	4	—	—
	VI	60	2	2	1	2	1	—	—	1	1	3	3	3	1	3	2	1	1	1	—	—
Total		930	145	120	84	100	98	97	92	78	89	98	81	76	63	62	54	40	37	34	—	—
	I	54	14	12	8	9	6	7	13	10	8	12	8	5	5	6	4	3	5	2	1	7
	II	308	87	53	64	65	57	61	60	61	52	56	49	47	42	31	27	29	17	8	12	71
Females	*III*	217	30	25	24	33	24	21	21	30	12	19	20	16	16	21	12	12	7	6	7	20
	IV	130	11	17	5	11	7	7	11	11	5	12	9	7	9	10	6	5	1	6	4	4
	V	61	2	12	3	2	1	5	5	2	4	2	6	1	1	6	5	3	2	1	4	3
	VI	62	—	3	2	1	1	1	—	—	1	1	—	4	5	8	12	2	3	2	4	—
Total		832	144	122	106	121	96	102	110	114	82	102	92	80	78	82	66	54	35	25	32	105

TABLE 5 (*cont.*)

DIETARY SURVEY

Population: Number of Persons according to Age, Expenditure Group, and Sex in Scotland and England

(*b*) Repeat Surveys

District	*Group*	*Years*																			*Pregnant*	*Lactating*
		18+	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Scotland	*I*	9	—	—	1	2	1	2	2	4	2	4	1	2	2	—	1	1	1	—	—	—
	II	52	3	6	12	6	8	8	5	8	13	10	8	9	8	9	4	4	2	1	—	—
Males	*III*	78	4	8	2	1	5	9	8	10	9	9	12	13	4	4	5	4	2	3	—	—
	IV	25	1	—	1	1	2	1	3	1	3	2	3	1	3	1	3	2	2	1	—	—
	V	17	—	1	2	—	—	3	2	—	2	—	—	—	—	—	—	1	—	—	—	—
	VI	15	1	—	—	1	—	1	—	1	4	1	1	—	3	—	—	—	—	—	—	—
Total		196	9	15	18	11	16	24	20	24	33	26	25	25	20	14	13	12	7	5	—	—
	I	7	—	4	1	—	2	2	—	2	1	4	—	3	1	3	—	—	—	—	2	—
	II	56	13	5	4	16	7	7	20	5	9	10	8	5	7	8	5	2	4	1	2	2
Females	*III*	78	3	3	8	5	8	11	6	10	6	11	11	7	12	9	4	3	—	—	—	2
	IV	25	1	—	1	1	1	1	1	4	3	—	1	—	—	1	2	—	1	1	—	—
	V	19	—	—	—	—	1	—	—	2	2	1	—	1	—	—	—	1	1	—	—	—
	VI	19	—	—	1	—	—	—	—	1	3	1	2	2	—	—	—	—	—	1	—	1
Total		204	17	12	15	22	19	21	27	24	24	27	22	18	20	21	11	6	6	3	4	5
England	*I*	17	1	3	2	1	4	4	4	7	1	2	2	3	3	1	1	1	—	—	—	—
	II	82	9	13	15	8	14	16	17	11	20	15	13	13	6	9	11	6	4	2	—	—
Males	*III*	63	4	7	9	5	3	6	3	11	2	10	6	5	4	6	5	7	5	3	—	—
	IV	23	—	2	2	—	4	1	—	1	2	5	2	3	2	—	2	2	—	1	—	—
	V	7	—	1	—	—	—	—	—	—	—	—	2	—	—	1	—	1	—	—	—	—
	VI	4	—	—	—	—	—	—	—	—	—	2	1	—	1	—	—	—	—	—	—	—
Total		196	14	26	28	14	25	27	24	30	25	34	26	24	16	17	19	17	9	6	—	—
	I	19	4	3	5	7	2	2	2	4	5	3	5	2	1	1	2	1	3	1	—	2
	II	85	8	10	15	11	17	12	13	8	8	17	16	18	14	11	8	8	9	2	2	4
Females	*III*	65	2	3	3	9	5	8	9	6	7	8	8	13	7	9	4	3	3	2	1	2
	IV	24	2	1	1	—	2	1	3	2	3	3	2	—	—	2	1	1	1	1	—	—
	V	6	—	—	—	2	—	1	—	—	—	—	—	—	—	1	1	—	—	—	—	—
	VI	4	—	—	—	—	—	—	—	1	—	1	1	—	—	—	—	—	—	—	—	—
Total		203	16	17	24	29	26	24	27	21	23	32	32	33	22	24	16	13	16	6	3	8

TABLE 6

DIETARY SURVEY

Population : Numbers of Families and Persons according to Expenditure Group and District

(*a*) *Original Surveys*

District	*Group I*		*Group II*		*Group III*		*Group IV*		*Group V*		*Group VI*	
	Families	*Persons*	*Families*	*Persons*	*Families*	*Persons*	*Families*	*Persons*	*Families*	*Persons*	*Families*	*Persons*
Scotland												
Aberdeen	—	—	14	102	10	57	4	20	5	25	4	29
Kintore	—	—	4	39	1	6	1	4	—	—	—	—
Hopeman	—	—	7	39	16	79	4	21	—	—	—	—
Barthol Chapel	—	—	7	43	11	57	11	48	2	9	4	13
Methlick	—	—	6	44	13	69	10	59	8	33	1	6
Tarves	—	—	38	245	37	215	13	64	9	53	8	56
West Wemyss	—	—	6	36	22	137	14	79	10	52	4	17
Coaltown of Wemyss	—	—	4	30	12	72	12	65	8	34	6	24
Dundee	4	31	50	340	17	87	14	58	7	34	7	33
Edinburgh	8	69	34	270	7	48	1	11	—	—	—	—
Total—Scotland	12	100	170	1,188	146	827	84	429	49	240	34	178
England												
Barrow	6	49	29	201	33	212	13	69	7	32	12	43
Liverpool	10	69	62	456	14	94	5	25	4	20	8	39
Yorkshire	1	7	39	250	38	176	18	78	4	19	3	7
Wisbech	7	61	43	293	47	250	35	154	20	86	10	36
Fulham	2	12	27	191	18	90	19	75	19	68	18	61
Bethnal Green	27	198	154	973	69	378	28	158	4	14	4	14
Total—England	53	396	354	2,364	219	1,200	118	559	58	239	55	200
All districts	65	496	524	3,552	365	2,027	202	988	107	479	89	378

TABLE 6 (*cont.*)

DIETARY SURVEY

Population : Numbers of Families and Persons according to Expenditure Group and District

(*b*) *Repeat Surveys*

District	*Group I*		*Group II*		*Group III*		*Group IV*		*Group V*		*Group VI*	
	Families	*Persons*	*Families*	*Persons*	*Families*	*Persons*	*Families*	*Persons*	*Families*	*Persons*	*Families*	*Persons*
Scotland												
Aberdeen	—	—	4	29	3	19	1	5	4	20	2	8
Kintore	—	—	—	—	—	—	—	—	—	—	—	—
Hopeman	—	—	8	51	8	46	1	3	—	—	—	—
Barthol Chapel	—	—	4	24	9	50	1	3	1	4	1	3
Methlick	—	—	1	8	11	56	4	19	—	—	2	10
Tarves	—	—	9	59	24	153	7	33	4	22	2	9
West Wemyss	—	—	2	11	4	29	5	23	1	5	1	3
Coaltown of Wemyss	—	—	1	10	2	12	3	14	—	—	4	12
Dundee	9	67	23	180	2	22	—	—	1	5	3	14
Edinburgh	—	—	—	—	—	—	—	—	—	—	—	—
Total—Scotland	9	67	52	372	63	387	22	100	11	56	15	59
England												
Barrow	—	—	—	—	—	—	—	—	—	—	—	—
Liverpool	—	—	—	—	—	—	—	—	—	—	—	—
Yorkshire	—	—	—	—	—	—	—	—	—	—	—	—
Wisbech	3	21	13	85	22	122	15	64	4	15	4	15
Fulham	—	—	6	45	9	49	1	3	—	—	—	—
Bethnal Green	16	110	63	450	25	170	6	35	2	8	—	—
Total—England	19	131	82	580	56	341	22	102	6	23	4	15
All districts	28	198	134	952	119	728	44	202	17	79	19	74

TABLE 7

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Aberdeen

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—	—					
1. Whole milk (pint)		1·92	3·10	4·73	4·80	6·05
2. Skimmed or buttermilk (pint)		nil	0·13	0·10	nil	nil
3. Condensed milk		1·67	0·93	nil	nil	nil
4. Dried milk		nil	nil	nil	nil	nil
5. Cream		0·16	0·10	1·39	0·23	4·80
6. Butter		0·78	1·58	4·40	5·13	5·00
7. Cheese		0·99	2·21	1·31	2·68	2·09
Eggs—	—					
8. Hen and duck		2·16	3·09	3·86	5·62	6·02
Meat and fish—	—					
9. Meat		14·52	18·95	17·91	26·09	36·13
10. Smoked pig meat		0·84	0·98	2·28	1·31	4·91
11. Fish		6·24	5·86	3·91	7·58	11·48
Fats—	—					
12. Animal		0·50	1·55	2·86	2·66	3·34
13. Vegetable		3·19	1·90	0·67	3·16	3·01
Vegetables—	—					
14. Potatoes		21·55	46·46	28·01	41·96	45·40
15. Other roots		3·42	5·30	8·51	10·92	12·75
16. Green		0·77	1·67	1·01	2·85	1·17
17. Dried		2·26	2·92	2·77	3·20	1·90
18. Canned		0·52	0·50	1·61	2·46	0·52
19. Other		2·90	3·62	3·14	5·71	5·93
Fruit—	—					
20. Fresh		1·36	5·92	14·58	27·25	36·03
21. Canned		0·14	0·16	0·35	5·33	6·78
22. Dried		0·14	0·63	3·60	2·56	1·46
Cereal products—	—					
23. Flour		1·00	2·15	2·33	7·05	15·84
24. Bread—white		45·33	39·77	20·14	22·72	24·57
25. Bread—brown		0·30	0·30	3·17	7·61	3·30
26. Rolls, buns, and scones		20·13	25·24	21·97	13·33	14·55
27. Biscuits		0·75	0·85	4·50	3·04	5·75
28. Cake		2·09	4·70	3·72	4·31	5·36
29. Oatmeal and oatcakes		1·81	6·16	5·22	7·66	10·37
30. Other farinaceous		1·77	3·63	4·56	6·70	5·27
Sugar products—	—					
31. Sugar		13·90	14·34	15·91	17·51	21·64
32. Syrup and treacle		2·14	4·53	1·36	1·37	2·12
33. Jam and marmalade		1·32	5·26	8·65	8·85	6·85
Beverages—	—					
34. Chocolate, cocoa, etc.		0·12	0·27	0·35	0·51	0·29

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Kintore

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—	—				—	—
1. Whole milk (pint)		3·64	8·91	3·50		
2. Skimmed or buttermilk (pint)		0·18	nil	3·38		
3. Condensed milk		nil	nil	nil		
4. Dried milk		nil	nil	nil		
5. Cream		nil	0·80	nil		
6. Butter		0·45	1·43	0·88		
7. Cheese		1·73	nil	2·25		
Eggs—	—				—	—
8. Hen and duck		1·08	3·66	1·00		
Meat and fish—	—					
9. Meat		13·70	6·36	20·63		
10. Smoked pig meat		0·30	nil	nil		
11. Fish		3·55	nil	4·50		
Fats—	—				—	—
12. Animal		0·91	nil	3·62		
13. Vegetable		2·44	1·27	5·00		
Vegetables—	—				—	—
14. Potatoes		58·53	48·35	105·00		
15. Other roots		7·08	5·25	18·75		
16. Green		0·79	6·52	20·50		
17. Dried		4·58	2·07	2·00		
18. Canned		nil	nil	nil		
19. Other		2·08	4·14	0·50		
Fruit—	—				—	—
20. Fresh		0·20	nil	2·75		
21. Canned		1·80	nil	nil		
22. Dried		0·23	nil	0·75		
Cereal products—	—				—	—
23. Flour		2·94	nil	5·50		
24. Bread—white		38·96	34·12	42·13		
25. Bread—brown		0·40	nil	nil		
26. Rolls, buns, and scones		3·86	3·66	14·25		
27. Biscuits		2·65	3·82	7·50		
28. Cake		3·88	nil	4·12		
29. Oatmeal and oatcakes		11·63	14·32	20·50		
30. Other farinaceous		3·01	4·77	1·50		
Sugar products—	—				—	—
31. Sugar		10·40	14·95	25·75		
32. Syrup and treacle		4·83	nil	nil		
33. Jam and marmalade		5·05	12·41	5·88		
Beverages—	—				—	—
34. Chocolate, cocoa, etc.		0·29	nil	nil		

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Hopeman

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—	—				—	—
1. Whole milk (pint)		2·18	3·15	4·47		
2. Skimmed or buttermilk (pint)		nil	nil	nil		
3. Condensed milk		0·28	1·06	nil		
4. Dried milk		nil	0·02	nil		
5. Cream		nil	0·06	nil		
6. Butter		1·90	2·92	4·23		
7. Cheese		0·94	1·27	2·16		
Eggs—	—				—	—
8. Hen and duck		0·79	1·87	4·23		
Meat and fish—						
9. Meat		8·58	9·70	14·66		
10. Smoked pig meat		0·49	0·92	1·71		
11. Fish		8·73	8·64	9·20		
Fats—	—				—	—
12. Animal		0·95	1·19	2·35		
13. Vegetable		1·09	0·59	0·36		
Vegetables—	—				—	—
14. Potatoes		28·18	32·40	34·62		
15. Other roots		7·17	8·44	16·73		
16. Green		2·40	0·38	5·04		
17. Dried		2·17	1·31	2·83		
18. Canned		0·06	0·12	0·50		
19. Other		2·31	2·27	7·01		
Fruit—	—				—	—
20. Fresh		5·80	9·82	18·73		
21. Canned		0·77	1·78	3·61		
22. Dried		0·10	0·65	1·62		
Cereal products—	—				—	—
23. Flour		0·79	1·61	1·54		
24. Bread—white		37·14	32·12	26·17		
25. Bread—brown		0·33	1·37	4·28		
26. Rolls, buns, and scones		11·65	11·73	21·91		
27. Biscuits		0·92	3·96	2·28		
28. Cake		2·62	4·07	3·09		
29. Oatmeal and oatcakes		4·79	2·78	4·82		
30. Other farinaceous		3·07	2·85	6·83		
Sugar products—	—				—	—
31. Sugar		11·92	14·56	14·33		
32. Syrup and treacle		1·38	0·13	0·71		
33. Jam and marmalade		6·77	9·19	7·75		
Beverages—	—				—	—
34. Chocolate, cocoa, etc.		0·28	0·10	0·36		

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Barthol Chapel—

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—	—					
1. Whole milk (pint)		4·03	5·51	6·25	9·12	7·89
2. Skimmed or buttermilk (pint)		1·43	0·86	1·87	nil	0·41
3. Condensed milk		nil	nil	nil	nil	nil
4. Dried milk		nil	nil	nil	nil	nil
5. Cream		nil	4·31	11·33	15·29	27·56
6. Butter		2·02	2·02	4·89	7·86	9·99
7. Cheese		1·56	2·80	3·32	3·06	4·20
Eggs—	—					
8. Hen and duck		1·55	1·96	3·38	2·74	4·00
Meat and fish—	—					
9. Meat		8·91	13·42	19·48	23·41	37·42
10. Smoked pig meat		0·37	0·27	0·16	nil	1·24
11. Fish		0·83	6·01	4·54	7·17	7·08
Fats—	—					
12. Animal		1·14	1·63	0·81	0·69	0·93
13. Vegetable		1·75	2·49	0·79	nil	1·14
Vegetables—	—					
14. Potatoes		68·05	62·08	59·97	77·62	83·45
15. Other roots		4·77	3·29	6·71	8·65	8·20
16. Green		1·43	2·02	5·94	11·34	1·07
17. Dried		1·42	2·40	2·21	1·85	1·55
18. Canned		nil	nil	nil	nil	nil
19. Other		1·94	1·30	2·77	1·48	5·86
Fruit—	—					
20. Fresh		1·91	4·17	2·58	7·49	8·27
21. Canned		nil	nil	0·41	3·16	3·82
22. Dried		0·38	0·41	1·91	1·21	2·76
Cereal products—	—					
23. Flour		5·95	7·00	10·08	20·46	4·62
24. Bread—white		30·08	30·74	26·21	32·32	29·42
25. Bread—brown		0·65	0·47	2·43	nil	6·17
26. Rolls, buns, and scones		2·91	5·30	8·19	8·17	12·44
27. Biscuits		1·54	3·31	4·57	6·59	3·34
28. Cake		0·35	1·15	4·73	6·12	7·03
29. Oatmeal and oatcakes		34·51	30·28	36·01	29·37	35·66
30. Other farinaceous		6·49	6·26	7·38	6·54	5·69
Sugar products—	—					
31. Sugar		11·65	17·53	22·98	21·30	24·39
32. Syrup and treacle		5·21	2·93	4·87	5·11	3·38
33. Jam and marmalade		7·79	7·99	7·15	13·29	9·82
Beverages—	—					
34. Chocolate, cocoa, etc.		0·39	0·05	0·05	nil	0·14

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Methlick

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—	—					
1. Whole milk (pint)		3·38	5·67	4·78	6·03	15·83
2. Skimmed or buttermilk (pint)		2·46	1·34	1·14	1·10	nil
3. Condensed milk		nil	nil	nil	0·33	nil
4. Dried milk		nil	nil	nil	nil	nil
5. Cream		nil	2·96	8·44	12·28	nil
6. Butter		0·71	3·34	3·43	6·95	10·50
7. Cheese		1·45	2·71	2·49	2·36	5·33
Eggs—	—					
8. Hen and duck		1·49	1·99	2·68	4·39	3·82
Meat and fish—	—					
9. Meat		6·53	13·04	21·60	21·66	39·93
10. Smoked pig meat		nil	0·20	1·39	1·57	4·14
11. Fish		0·75	5·45	7·75	6·86	2·55
Fats—	—					
12. Animal		0·95	1·23	1·20	2·17	0·48
13. Vegetable		3·26	1·97	2·50	1·14	nil
Vegetables—	—					
14. Potatoes		66·21	67·39	66·84	72·69	96·73
15. Other roots		2·77	2·52	5·10	3·52	11·77
16. Green		5·05	6·17	6·01	20·38	25·61
17. Dried		4·10	2·27	2·57	0·83	3·02
18. Canned		0·42	nil	nil	nil	nil
19. Other		1·05	2·88	3·44	4·75	1·51
Fruit—	—					
20. Fresh		2·84	3·72	13·48	22·73	20·68
21. Canned		nil	1·21	0·50	0·33	4·14
22. Dried		0·26	0·21	1·52	2·29	nil
Cereal products—	—					
23. Flour		7·03	7·03	5·09	5·75	3·26
24. Bread—white		31·70	34·77	31·41	21·35	30·47
25. Bread—brown		2·27	1·48	2·18	2·10	4·45
26. Rolls, buns, and scones		4·06	6·85	11·75	16·28	1·59
27. Biscuits		1·84	3·83	3·79	5·19	3·82
28. Cake		1·73	2·07	4·26	6·18	2·55
29. Oatmeal and oatcakes		30·01	29·50	18·25	25·69	29·91
30. Other farinaceous		6·89	7·44	6·31	6·38	10·82
Sugar products—	—					
31. Sugar		15·25	16·54	20·16	21·99	19·89
32. Syrup and treacle		5·28	5·85	2·82	2·37	19·09
33. Jam and marmalade		4·84	8·36	10·28	10·58	5·73
Beverages—	—					
34. Chocolate, cocoa, etc.		0·24	0·18	0·18	0·14	nil

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Tarves

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—	—					
1. Whole milk (pint)		3·98	5·41	7·13	6·54	6·99
2. Skimmed or buttermilk (pint)		2·26	1·70	0·47	0·96	0·58
3. Condensed milk		nil	nil	nil	nil	nil
4. Dried milk		nil	nil	nil	nil	nil
5. Cream		0·41	0·66	4·28	10·97	15·18
6. Butter		1·46	2·73	4·64	4·37	7·24
7. Cheese		1·62	2·17	2·23	1·28	1·20
Eggs—	—					
8. Hen and duck		2·17	3·10	3·77	4·16	5·46
Meat and fish—	—					
9. Meat		9·34	13·46	17·12	22·57	24·87
10. Smoked pig meat		0·08	0·38	0·53	2·95	3·19
11. Fish		3·79	4·34	8·68	7·03	7·94
Fats—	—					
12. Animal		0·75	1·11	1·55	1·18	1·74
13. Vegetable		2·30	1·68	1·77	0·97	1·69
Vegetables—	—					
14. Potatoes		75·57	85·62	77·00	67·36	67·68
15. Other roots		1·05	1·07	1·61	2·02	3·56
16. Green		0·86	0·35	1·51	3·02	2·00
17. Dried		2·05	2·31	3·02	2·11	2·28
18. Canned		nil	0·14	0·51	0·55	2·20
19. Other		1·27	2·53	2·85	1·74	5·34
Fruit—	—					
20. Fresh		5·41	4·81	16·88	21·55	21·32
21. Canned		0·14	0·18	1·97	4·18	7·97
22. Dried		0·28	0·31	0·86	2·21	3·21
Cereal products—	—					
23. Flour		6·40	5·09	4·83	4·78	5·52
24. Bread—white		34·21	32·79	24·20	23·69	20·68
25. Bread—brown		1·34	2·45	5·33	5·69	4·18
26. Rolls, buns, and scones		3·86	8·13	14·64	10·42	7·48
27. Biscuits		2·05	3·82	5·50	7·11	5·68
28. Cake		1·21	1·89	4·65	5·17	7·55
29. Oatmeal and oatcakes		34·06	31·04	23·98	17·44	15·93
30. Other farinaceous		5·74	6·79	6·59	4·35	4·89
Sugar products	—					
31. Sugar		14·64	17·04	20·54	18·00	16·26
32. Syrup and treacle		5·22	5·86	5·19	2·76	4·24
33. Jam and marmalade		4·31	6·03	4·54	8·55	5·34
Beverages—	—					
34. Chocolate, cocoa, etc.		0·17	0·18	0·08	0·20	0·36

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : mean amount per head per week (oz.)

District : West Wemyss

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—	—					
1. Whole milk (pint)		0·55	1·52	1·27	2·38	4·33
2. Skimmed or buttermilk (pint)		nil	0·02	0·04	nil	nil
3. Condensed milk		2·02	0·45	1·07	0·84	nil
4. Dried milk		0·06	nil	0·01	nil	nil
5. Cream		nil	nil	nil	nil	0·09
6. Butter		6·02	6·35	8·23	10·49	10·02
7. Cheese		1·68	1·97	1·72	2·38	1·23
Eggs—	—					
8. Hen and duck		1·16	2·34	3·48	4·24	6·68
Meat and fish—	—					
9. Meat		11·88	16·53	18·74	25·28	19·39
10. Smoked pig meat		1·79	1·62	2·52	1·83	5·77
11. Fish		1·44	4·61	8·86	10·98	9·05
Fats—	—					
12. Animal		0·44	1·13	1·08	1·24	3·38
13. Vegetable		1·50	1·72	1·09	0·75	0·64
Vegetables—	—					
14. Potatoes		26·59	53·58	59·51	60·06	59·48
15. Other roots		8·28	10·90	12·50	11·63	10·90
16. Green		0·17	1·11	0·16	1·13	nil
17. Dried		0·83	2·88	3·69	4·88	1·93
18. Canned		0·73	0·81	1·34	0·73	3·81
19. Other		2·77	4·43	3·80	3·89	5·27
Fruit—	—					
20. Fresh		3·45	11·37	11·10	22·19	36·35
21. Canned		0·14	0·20	1·90	0·66	10·57
22. Dried		nil	0·15	0·23	0·15	0·67
Cereal products—	—					
23. Flour		0·19	0·96	1·51	1·02	3·66
24. Bread—white		49·81	49·76	62·25	57·97	50·11
25. Bread—brown		0·78	1·83	1·15	2·18	1·41
26. Rolls, buns, and scones		18·79	19·30	19·33	28·04	23·49
27. Biscuits		2·24	1·12	5·48	3·11	5·13
28. Cake		2·26	4·15	6·85	8·84	8·38
29. Oatmeal and oatcakes		0·10	1·15	1·39	2·15	3·46
30. Other farinaceous		0·25	2·19	2·56	2·42	4·86
Sugar Products—	—					
31. Sugar		12·92	13·01	15·19	16·74	19·15
32. Syrup and treacle		0·43	0·75	0·18	0·90	1·61
33. Jam and marmalade		3·49	5·65	6·40	6·46	10·05
Beverages—	—					
34. Chocolate, cocoa, etc.		0·28	0·26	0·13	0·17	0·47

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Coaltown of Wemyss

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—	—					
1. Whole milk (pint)		1·23	2·10	2·46	3·42	4·25
2. Skimmed or buttermilk (pint)		nil	0·06	0·04	nil	nil
3. Condensed milk		1·09	0·74	0·71	0·17	nil
4. Dried milk		nil	nil	nil	nil	nil
5. Cream		nil	nil	0·37	nil	1·00
6. Butter		2·95	4·24	8·29	7·55	15·22
7. Cheese		1·18	2·00	2·00	1·67	3·70
Eggs—	—					
8. Hen and duck		2·42	2·57	2·79	4·91	7·68
Meat and fish—	—					
9. Meat		10·40	14·38	18·79	24·59	36·93
10. Smoked pig meat		2·42	1·43	1·69	1·36	5·40
11. Fish		3·05	1·40	6·50	8·15	15·04
Fats—	—					
12. Animal		0·35	0·72	1·51	1·09	1·12
13. Vegetable		1·09	2·99	2·31	2·00	2·66
Vegetables—	—					
14. Potatoes		24·67	54·57	59·38	64·40	53·51
15. Other roots		5·52	11·58	8·17	12·54	9·49
16. Green		0·40	2·72	3·34	6·14	5·60
17. Dried		2·90	4·23	2·17	1·77	3·18
18. Canned		nil	0·55	0·62	1·67	1·44
19. Other		1·96	4·61	5·20	7·25	9·71
Fruit—	—					
20. Fresh		4·23	7·01	12·38	30·97	34·61
21. Canned		nil	0·23	0·55	1·83	1·86
22. Dried		0·12	0·54	1·39	1·46	4·62
Cereal products—	—					
23. Flour		0·07	3·08	4·87	3·20	5·62
24. Bread—white		54·01	63·84	53·44	44·29	54·21
25. Bread—brown		1·06	2·69	2·33	4·38	4·94
26. Rolls, buns, and scones		15·46	14·72	18·88	17·18	7·24
27. Biscuits		1·18	1·58	2·74	5·48	5·90
28. Cake		5·79	5·60	9·14	13·04	13·98
29. Oatmeal and oatcakes		1·16	2·35	1·54	2·25	2·90
30. Other farinaceous		0·58	1·93	2·47	2·97	5·57
Sugar products—	—					
31. Sugar		8·48	14·45	17·04	17·19	19·06
32. Syrup and treacle		0·48	1·75	1·21	0·99	1·72
33. Jam and marmalade		4·61	8·52	6·42	8·99	7·30
Beverages—	—					
34. Chocolate, cocoa, etc.		0·03	0·17	0·17	0·30	0·22

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Dundee

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·92	0·94	1·67	2·96	4·68	5·32
2. Skimmed or buttermilk (pint)	nil	0·08	nil	nil	nil	nil
3. Condensed milk	3·23	4·31	3·85	3·85	1·18	nil
4. Dried milk	nil	nil	0·02	nil	nil	nil
5. Cream	nil	nil	nil	0·05	0·15	4·58
6. Butter	nil	0·56	2·03	3·63	6·10	8·60
7. Cheese	1·55	1·31	2·31	1·68	3·87	2·12
Eggs—						
8. Hen and duck	0·45	1·16	2·46	4·35	3·90	4·97
Meat and fish—						
9. Meat	13·19	15·12	19·71	25·44	23·24	42·11
10. Smoked pig meat	0·52	0·84	2·12	3·76	4·47	4·42
11. Fish	2·61	3·16	5·69	5·73	5·27	11·46
Fats—						
12. Animal	0·63	0·62	1·26	1·53	1·62	3·04
13. Vegetable	5·03	5·04	5·46	6·55	3·85	3·11
Vegetables—						
14. Potatoes	35·16	43·21	52·94	61·93	58·30	46·71
15. Other roots	12·32	6·76	9·21	7·66	7·23	15·63
16. Green	0·84	2·14	4·50	4·18	1·57	10·16
17. Dried	3·21	2·97	4·05	2·66	1·86	0·71
18. Canned	nil	0·56	0·09	1·54	nil	2·62
19. Other	3·79	3·12	2·60	4·91	4·21	11·97
Fruit—						
20. Fresh	1·61	2·95	6·80	10·19	9·08	40·88
21. Canned	nil	0·28	2·52	0·84	2·35	6·15
22. Dried	nil	0·09	0·41	1·25	2·45	7·45
Cereal products—						
23. Flour	0·68	1·01	3·17	4·77	5·36	9·17
24. Bread—white	33·45	50·86	49·94	48·87	35·71	19·82
25. Bread—brown	8·85	0·80	0·60	1·78	5·01	4·85
26. Rolls, buns, and scones	5·94	12·56	17·34	10·26	11·14	9·88
27. Biscuits	0·13	1·54	2·22	1·90	5·45	3·52
28. Cake	0·32	2·06	3·38	4·06	5·97	11·84
29. Oatmeal and oatcakes	1·84	1·78	1·25	9·85	7·19	3·25
30. Other farinaceous	0·65	1·51	1·48	3·26	4·55	4·03
Sugar products						
31. Sugar	16·40	13·18	15·60	19·14	18·36	17·21
32. Syrup and treacle	4·32	1·50	2·38	2·92	1·86	1·90
33. Jam and marmalade	3·74	3·03	3·03	6·33	10·34	9·59
Beverages—						
34. Chocolate, cocoa, etc.	0·34	0·10	0·30	0·42	0·51	0·58

APPENDIX 3

TABLE 7 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Edinburgh

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—					—	—
1. Whole milk (pint)	0·99	1·09	1·89	0·91		
2. Skimmed or buttermilk (pint)	0·03	0·01	nil	nil		
3. Condensed milk	2·53	4·37	6·12	2·45		
4. Dried milk	nil	nil	nil	nil		
5. Cream	nil	nil	nil	nil		
6. Butter	nil	0·51	1·90	nil		
7. Cheese	0·75	1·43	1·29	2·18		
Eggs—					—	—
8. Hen and duck	1·80	2·82	4·35	5·45		
Meat and fish—					—	—
9. Meat	11·25	16·73	20·37	41·41		
10. Smoked pig meat	1·51	1·98	2·73	2·91		
11. Fish	2·62	5·20	3·21	10·27		
Fats—					—	—
12. Animal	0·88	0·64	1·12	1·45		
13. Vegetable	5·17	6·66	6·31	9·82		
Vegetables—					—	—
14. Potatoes	30·31	45·11	59·75	66·23		
15. Other roots	3·75	5·99	6·67	6·18		
16. Green	nil	1·02	1·90	0·73		
17. Dried	2·09	3·07	2·50	nil		
18. Canned	1·99	0·65	1·01	10·64		
19. Other	2·48	3·69	4·62	1·64		
Fruit—					—	—
20. Fresh	0·46	3·67	5·71	1·45		
21. Canned	nil	0·16	0·75	nil		
22. Dried	nil	0·20	0·17	nil		
Cereal products—					—	—
23. Flour	0·12	1·03	1·25	nil		
24. Bread—white	60·94	70·82	64·28	71·27		
25. Bread—brown	nil	2·26	2·42	nil		
26. Rolls, buns, and scones	4·13	5·14	13·97	14·18		
27. Biscuits	0·52	0·55	1·33	nil		
28. Cake	0·55	1·53	1·35	4·77		
29. Oatmeal and oatcakes	3·09	2·62	5·33	nil		
30. Other farinaceous	0·67	1·40	3·00	nil		
Sugar products—					—	—
31. Sugar	9·80	13·25	15·64	23·27		
32. Syrup and treacle	nil	0·36	nil	nil		
33. Jam and marmalade	1·14	3·12	4·18	2·91		
Beverages—					—	—
34. Chocolate, cocoa, etc.	0·06	0·26	0·20	nil		

TABLE 8

DIETARY SURVEY (ENGLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Barrow

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·60	0·95	1·42	2·45	3·61	5·63
2. Skimmed or buttermilk (pint)	nil	0·06	nil	nil	nil	nil
3. Condensed milk	3·12	4·62	3·93	2·09	0·58	0·50
4. Dried milk	nil	nil	nil	nil	nil	nil
5. Cream	nil	0·04	0·15	0·39	0·11	1·04
6. Butter	0·88	1·96	4·01	6·24	8·02	11·17
7. Cheese	1·20	0·81	1·68	1·84	1·48	1·79
Eggs—						
8. Hen and duck	0·51	1·18	2·30	4·08	4·30	5·46
Meat and fish—						
9. Meat	8·79	12·26	17·72	21·25	26·11	34·16
10. Smoked pig meat	1·51	2·85	3·97	5·68	5·09	8·01
11. Fish	2·69	4·02	4·94	6·60	5·71	12·04
Fats—						
12. Animal	1·31	1·24	2·26	2·04	3·85	2·75
13. Vegetable	3·76	3·95	3·97	2·29	1·95	2·24
Vegetables—						
14. Potatoes	36·94	46·63	66·07	63·44	64·01	63·51
15. Other roots	1·31	1·69	4·68	5·05	4·73	8·58
16. Green	1·39	3·50	5·12	12·18	9·78	21·48
17. Dried	1·96	1·82	1·79	2·75	1·68	2·36
18. Canned	0·33	0·74	0·41	1·28	1·82	0·61
19. Other	2·45	4·05	4·79	7·01	9·92	10·36
Fruit—						
20. Fresh	2·82	6·49	11·87	19·48	31·94	42·15
21. Canned	nil	0·89	1·96	4·50	1·88	3·88
22. Dried	0·49	0·56	0·90	1·82	1·12	1·90
Cereal products—						
23. Flour	4·57	14·76	15·23	8·82	22·67	13·62
24. Bread—white	38·73	31·21	43·01	39·81	28·32	34·03
25. Bread—brown	nil	0·48	1·85	5·90	1·48	9·12
26. Rolls, buns, and scones	1·49	0·93	1·29	1·23	2·63	4·78
27. Biscuits	0·41	1·10	1·78	3·27	2·12	3·56
28. Cake	1·37	1·68	3·25	6·18	7·40	9·15
29. Oatmeal and oatcakes	1·94	0·40	1·00	1·12	0·97	0·56
30. Other farinaceous	1·02	1·32	2·82	4·20	3·21	5·87
Sugar products—						
31. Sugar	12·61	14·52	14·87	17·21	15·79	19·42
32. Syrup and treacle	0·65	0·22	0·56	0·68	0·02	1·52
33. Jam and marmalade	2·41	1·78	3·46	3·90	7·12	6·74
Beverages—						
34. Chocolate, cocoa, etc.	nil	0·27	0·20	0·33	0·22	0·19

TABLE 8 (*cont.*)

DIETARY SURVEY (ENGLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Liverpool

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·24	0·63	1·49	3·14	5·74	4·85
2. Skimmed or buttermilk (pint)	nil	nil	nil	nil	nil	nil
3. Condensed milk	6·08	6·22	5·55	0·57	0·64	0·54
4. Dried milk	nil	0·03	nil	nil	nil	nil
5. Cream	nil	nil	0·06	nil	0·17	0·46
6. Butter	nil	1·23	2·12	8·09	8·87	8·43
7. Cheese	0·52	1·29	1·57	1·64	1·26	2·38
Eggs—						
8. Hen and duck	0·62	1·01	2·52	2·15	2·45	4·99
Meat and fish—						
9. Meat	15·44	16·00	20·79	23·40	26·63	26·71
10. Smoked pig meat	1·90	2·57	5·25	2·77	8·60	6·24
11. Fish	4·17	5·62	8·62	4·09	8·03	9·10
Fats—						
12. Animal	0·44	1·36	1·20	1·61	0·72	3·39
13. Vegetable	5·93	6·75	6·57	0·54	1·15	2·80
Vegetables—						
14. Potatoes	54·58	53·73	59·80	49·27	45·81	52·52
15. Other roots	6·21	4·03	3·78	5·46	5·75	16·98
16. Green	7·12	8·44	9·21	11·44	17·74	18·13
17. Dried	3·06	1·88	1·70	1·44	0·73	1·83
18. Canned	0·71	0·30	0·62	1·70	2·73	3·75
19. Other	2·86	2·68	4·35	12·88	7·13	19·45
Fruit—						
20. Fresh	5·86	9·17	10·95	40·12	34·43	65·95
21. Canned	0·62	0·40	2·68	3·97	2·52	4·99
22. Dried	0·35	0·49	0·75	2·14	1·28	4·09
Cereal products—						
23. Flour	2·53	2·97	3·13	3·02	5·64	7·50
24. Bread—white	54·24	61·86	59·37	22·72	28·50	30·36
25. Bread—brown	1·64	2·79	4·68	6·71	8·27	10·60
26. Rolls, buns, and scones	0·46	0·72	1·79	3·21	1·39	1·46
27. Biscuits	0·63	1·56	2·67	3·47	2·09	3·81
28. Cake	1·96	2·43	4·25	6·40	5·76	5·55
29. Oatmeal and oatcakes	1·33	1·36	2·39	1·08	nil	1·11
30. Other farinaceous	0·92	1·48	2·75	2·76	3·44	2·02
Sugar products—						
31. Sugar	8·71	11·61	13·83	12·98	17·87	15·88
32. Syrup and treacle	0·24	0·42	0·43	0·28	0·06	2·01
33. Jam and marmalade	1·20	2·82	2·89	3·99	5·18	8·18
Beverages—						
34. Chocolate, cocoa, etc.	0·09	0·19	0·33	0·32	0·68	0·59

TABLE 8 (*cont.*)

DIETARY SURVEY (ENGLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Yorkshire, West Riding

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·14	0·73	1·43	2·07	1·24	4·23
2. Skimmed or buttermilk (pint)	nil	0·03	nil	nil	nil	nil
3. Condensed milk	nil	3·20	3·71	2·13	11·11	0·84
4. Dried milk	nil	nil	nil	nil	1·53	nil
5. Cream	nil	0·08	0·19	0·24	nil	1·81
6 Butter	2·29	3·09	4·60	5·49	4·42	10·24
7. Cheese	nil	1·41	1·08	1·48	0·47	1·46
Eggs—						
8. Hen and duck	1·71	1·65	2·88	3·49	7·00	3·76
Meat and fish—						
9. Meat	8·57	13·35	19·16	25·40	25·36	24·31
10. Smoked pig meat	2·29	2·79	4·24	7·21	7·79	8·85
11. Fish	3·57	4·70	6·43	7·78	9·87	7·10
Fats—						
12. Animal	2·57	3·41	4·65	5·54	10·13	9·82
13. Vegetable	1·14	3·19	2·39	2·91	6·89	4·25
Vegetables—						
14. Potatoes	34·86	51·94	50·86	74·68	79·37	72·44
15. Other roots	3·43	3·90	4·75	7·89	2·53	14·70
16. Green	nil	1·38	2·80	5·14	4·21	nil
17. Dried	1·71	0·75	1·36	1·55	1·58	1·67
18. Canned	4·86	1·39	1·60	2·64	4·21	0·70
19. Other	1·14	2·61	3·67	4·78	9·89	6·20
Fruit—						
20. Fresh	4·00	7·35	14·10	16·85	12·76	38·73
21. Canned	2·43	2·14	4·09	3·01	8·36	7·66
22. Dried	nil	0·40	0·76	1·17	3·37	3·41
Cereal products—						
23. Flour	48·00	40·29	43·22	57·06	79·37	40·88
24. Bread—white	10·14	9·03	9·62	8·77	15·84	18·81
25. Bread—brown	nil	1·11	1·82	1·12	nil	5·01
26. Rolls, buns, and scones	1·71	1·24	1·84	2·06	2·58	3·06
27. Biscuits	nil	2·18	2·87	2·52	3·82	4·25
28. Cake	1·43	2·03	2·80	7·57	4·87	11·42
29. Oatmeal and oatcakes	0·21	0·63	0·66	0·96	1·11	4·04
30. Other farinaceous	2·29	1·19	2·22	2·61	3·53	2·86
Sugar products—						
31. Sugar	15·29	12·97	15·25	15·86	26·26	29·95
32. Syrup and treacle	nil	0·43	0·81	0·57	nil	1·32
33. Jam and marmalade	nil	2·00	2·80	2·82	3·21	7·87
Beverages—						
34. Chocolate, cocoa, etc.	nil	0·25	0·37	0·29	0·63	1·08

TABLE 8 (*cont.*)

DIETARY SURVEY (ENGLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Wisbech

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·41	0·79	1·89	2·81	2·94	4·55
2. Skimmed or buttermilk (pint)	nil	0·09	0·21	0·34	0·04	0·67
3. Condensed milk	3·06	4·59	4·02	1·88	3·91	nil
4. Dried milk	nil	nil	nil	nil	nil	nil
5. Cream	nil	0·15	0·04	0·31	0·31	0·22
6. Butter	0·49	1·73	4·97	5·94	6·81	10·60
7. Cheese	0·98	1·56	2·62	2·59	3·29	5·30
Eggs—						
8. Hen and duck	0·44	1·89	3·04	3·87	4·69	6·75
Meat and fish—						
9. Meat	11·99	15·59	18·19	26·06	31·02	39·15
10. Smoked pig meat	0·77	1·81	3·79	4·80	6·19	8·91
11. Fish	2·79	3·06	4·87	4·66	8·89	5·53
Fats—						
12. Animal	0·82	1·98	3·20	4·68	4·06	5·30
13. Vegetable	4·32	5·14	3·32	2·37	2·42	1·11
Vegetables—						
14. Potatoes	37·29	57·35	64·61	69·63	60·93	69·11
15. Other roots	0·46	0·19	0·35	1·56	1·68	0·80
16. Green	5·03	5·60	7·72	6·66	17·49	5·11
17. Dried	1·44	0·79	1·28	1·60	1·32	2·91
18. Canned	0·16	0·15	0·52	1·85	2·19	1·83
19. Other	3·06	3·26	6·57	9·88	8·25	9·13
Fruit—						
20. Fresh	4·01	4·18	10·22	15·63	23·66	30·62
21. Canned	0·26	1·78	2·83	7·44	7·65	7·82
22. Dried	0·32	1·03	1·07	2·24	2·01	2·33
Cereal products—						
23. Flour	5·41	12·62	15·72	18·24	18·10	26·86
24. Bread—white	57·60	56·05	52·82	52·61	50·19	54·02
25. Bread—brown	1·05	1·51	1·95	2·03	7·19	3·40
26. Rolls, buns, and scones	0·77	0·44	1·24	1·31	1·99	2·07
27. Biscuits	0·86	0·82	1·45	2·76	2·39	3·93
28. Cake	2·59	2·81	5·21	5·39	10·11	9·95
29. Oatmeal and oatcakes	1·16	0·65	1·27	1·16	0·88	1·73
30. Other farinaceous	0·61	1·26	1·87	3·22	2·34	5·07
Sugar products—						
31. Sugar	10·25	17·33	17·66	22·85	24·54	27·40
32. Syrup and treacle	nil	0·20	0·60	0·54	0·68	0·89
33. Jam and marmalade	1·14	2·47	3·84	4·52	5·47	8·63
Beverages—						
34. Chocolate, cocoa, etc.	0·42	0·31	0·41	0·51	0·80	0·80

TABLE 8 (*cont.*)

DIETARY SURVEY (ENGLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Fulham

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·25	0·87	1·61	3·05	4·09	4·44
2. Skimmed or buttermilk (pint)	nil	nil	0·01	nil	nil	nil
3. Condensed milk	6·92	6·24	6·81	1·96	2·75	1·08
4. Dried milk	nil	nil	nil	0·04	0·19	0·42
5. Cream	nil	nil	0·53	0·62	1·24	2·95
6. Butter	0·87	0·65	2·22	4·47	7·04	9·90
7. Cheese	nil	0·79	2·31	2·80	2·83	2·17
Eggs—						
8. Hen and duck	0·75	1·80	3·06	2 83	3·87	5·35
Meat and fish—						
9. Meat	21·83	20·41	26·88	25·35	21·65	27·17
10. Smoked pig meat	6·00	2·37	2·26	3·61	5·19	5·08
11. Fish	0·67	3·68	6·58	5·53	6·36	12·08
Fats—						
12. Animal	nil	0·82	1·22	1·40	2·05	1·90
13. Vegetable	4·17	5·70	4·38	3·22	2·06	1·74
Vegetables—						
14. Potatoes	48·67	40·58	40·77	40·21	39·64	39·12
15. Other roots	0·67	0·42	1·31	2·82	2·90	3·59
16. Green	10·67	12·84	21·63	20·74	26·64	38·04
17. Dried	nil	0·74	0·21	0·41	0·03	nil
18. Canned	nil	0·42	1·26	1·50	0·26	0·08
19. Other	3·33	2·87	3·82	4·80	5·72	4·61
Fruit—						
20. Fresh	3·08	5·16	9·34	21·72	36·77	52·30
21. Canned	nil	1·02	2·98	4·78	3·67	5·97
22. Dried	nil	0·35	0·28	1·63	1·95	2·67
Cereal products—						
23. Flour	0·37	2·11	4·10	4·91	4·53	5·14
24. Bread—white	34·33	52·18	46·27	39·51	37·94	37·07
25. Bread—brown	nil	1·17	0·49	1·35	2·34	4·91
26. Rolls, buns, and scones	nil	0·56	1·75	3·31	1·63	2·38
27. Biscuits	nil	1·08	2·53	3·15	2·46	3·36
28. Cake	3·37	2·35	5·06	4·34	5·71	6·89
29. Oatmeal and oatcakes	nil	0·62	0·88	0·41	0·89	0·50
30. Other farinaceous	nil	1·15	1·86	2·78	3·24	3·90
Sugar products—						
31. Sugar	10·17	11·22	14·06	13·66	14·76	17·62
32. Syrup and treacle	nil	0·23	0·37	0·51	0·42	0·01
33. Jam and marmalade	1·21	2·22	2·89	3·77	3·94	7·03
Beverages—						
34. Chocolate, cocoa, etc.	0·04	0·19	0·28	0·13	0·26	0·40

TABLE 8 (*cont.*)

DIETARY SURVEY (ENGLAND)

Foodstuffs : Mean amount per head per week (oz.)

District : Bethnal Green

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·22	0·65	1·08	1·88	2·86	3·18
2. Skimmed or buttermilk (pint)	nil	nil	nil	nil	nil	nil
3. Condensed milk	5·62	5·51	6·68	5·32	5·50	5·14
4. Dried milk	nil	0·04	0·08	nil	nil	nil
5. Cream	nil	nil	0·04	0·05	1·25	1·41
6. Butter	0·11	0·37	0·98	1·94	3·82	5·59
7. Cheese	0·67	1·09	1·50	2·00	2·14	2·67
Eggs—						
8. Hen and duck	1·49	1·85	3·03	3·69	3·93	5·56
Meat and fish—						
9. Meat	17·19	22·80	28·56	32·13	32·32	38·55
10. Smoked pig meat	1·65	1·78	2·58	3·47	11·00	4·01
11. Fish	1·59	4·71	7·91	9·85	11·79	19·80
Fats—						
12. Animal	0·49	0·90	1·56	1·25	2·96	4·08
13. Vegetable	4·76	5·63	6·02	8·74	3·96	8·34
Vegetables—						
14. Potatoes	45·36	53·90	58·89	66·84	75·57	51·22
15. Other roots	0·87	1·35	1·93	2·43	3·43	4·85
16. Green	6·57	10·73	11·60	12·27	17·21	11·40
17. Dried	1·52	1·02	1·28	1·44	1·68	0·21
18. Canned	0·22	0·36	0·45	1·09	1·57	nil
19. Other	1·85	2·55	5·08	6·32	6·54	14·07
Fruit—						
20. Fresh	1·76	6·16	13·20	13·67	23·29	36·65
21. Canned	0·14	0·40	0·73	1·72	1·29	6·26
22. Dried	0·11	0·52	0·74	0·90	1·71	3·73
Cereal products—						
23. Flour	2·41	4·09	5·49	7·30	6·07	10·62
24. Bread—white	43·97	48·15	57·10	55·15	47·68	50·41
25. Bread—brown	nil	0·13	0·48	0·99	1·14	3·38
26. Rolls, buns, and scones	0·07	0·50	1·41	3·29	1·71	6·37
27. Biscuits	0·38	1·20	1·64	2·13	2·86	3·66
28. Cake	0·58	1·84	2·56	3·76	5·00	3·38
29. Oatmeal and oatcakes	0·41	1·06	1·37	1·66	1·86	4·92
30. Other farinaceous	1·03	1·52	2·38	2·85	6·43	3·76
Sugar products						
31. Sugar	9·24	11·53	13·84	15·16	17·18	23·64
32. Syrup and treacle	0·13	0·05	0·22	0·04	nil	nil
33. Jam and marmalade	1·14	2·24	2·70	2·93	5·00	2·95
Beverages—						
34. Chocolate, cocoa, etc.	0·14	0·32	0·35	0·23	0·68	0·46

TABLE 9

DIETARY SURVEY

Foodstuffs : Mean amount per head per week (oz.)

Scotland

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·97	2·03	3·58	3·93	4·81	6·25
2. Skimmed or buttermilk (pint)	0·02	0·65	0·64	0·49	0·37	0·21
3. Condensed milk	2·74	2·45	1·05	0·88	0·41	nil
4. Dried milk	nil	nil	nil	nil	nil	nil
5. Cream	nil	0·10	0·75	3·22	4·85	8·65
6. Butter	nil	1·08	3·26	5·38	6·95	8·72
7. Cheese	1·00	1·40	2·08	2·14	2·30	2·22
Eggs—						
8. Hen and duck	1·38	1·87	2·64	3·48	4·38	5·67
Meat and fish—						
9. Meat	11·86	13·19	14·99	20·17	23·80	32·33
10. Smoked pig meat	1·20	0·93	1·05	1·76	2·22	4·09
11. Fish	2·62	3·98	4·91	7·18	7·82	9·92
Fats—						
12. Animal	0·80	0·68	1·17	1·44	1·52	2·19
13. Vegetable	5·13	4·06	2·44	2·46	1·68	2·09
Vegetables—						
14. Potatoes	31·82	49·43	61·57	61·31	62·71	59·39
15. Other roots	6·41	4·91	6·04	7·76	7·66	9·35
16. Green	0·26	1·45	1·94	3·31	5·70	4·36
17. Dried	2·44	2·68	2·70	2·70	2·53	1·98
18. Canned	1·38	0·39	0·33	0·99	0·77	1·79
19. Other	2·88	2·62	3·14	3·88	4·16	7·11
Fruit—						
20. Fresh	0·82	3·50	6·71	11·60	21·52	29·31
21. Canned	nil	0·24	0·69	1·15	2·37	6·37
22. Dried	nil	0·18	0·36	1·22	1·71	3·50
Cereal products—						
23. Flour	0·29	2·56	3·55	4·45	4·82	7·55
24. Bread—white	52·42	49·11	42·19	41·23	35·42	29·20
25. Bread—brown	2·74	1·22	1·68	2·53	4·12	4·15
26. Rolls, buns, and scones	4·69	8·98	12·96	15·06	16·28	10·65
27. Biscuits	0·40	1·40	2·66	3·93	5·08	5·00
28. Cake	0·48	1·87	3·05	5·47	7·27	8·66
29. Oatmeal and oatcakes	2·70	11·37	14·44	12·69	11·29	11·73
30. Other farinaceous	0·66	2·82	4·27	4·53	4·40	5·11
Sugar products—						
31. Sugar	11·84	13·33	15·48	18·62	18·34	18·61
32. Syrup and treacle	1·34	2·40	3·08	2·43	1·88	3·30
33. Jam and marmalade	1·95	3·66	6·40	6·79	8·93	7·39
Beverages—						
34. Chocolate, cocoa, etc.	0·14	0·18	0·19	0·18	0·27	0·35

APPENDIX 3

TABLE 10

DIETARY SURVEY

Foodstuffs : Mean amount per head per week (oz.)

England

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·30	0·72	1·43	2·44	3·45	4·70
2. Skimmed or buttermilk (pint)	nil	0·02	0·04	0·09	0·01	0·12
3. Condensed milk	4·94	5·27	5·12	2·87	3·52	0·93
4. Dried milk	nil	0·02	0·03	nil	0·17	0·13
5. Cream	nil	0·03	0·12	0·26	0·56	1·41
6. Butter	0·30	1·15	3·07	4·66	6·85	9·72
7. Cheese	0·72	1·17	1·77	2·16	2·46	2·70
Eggs—						
8. Hen and duck	1·04	1·61	2·84	3·56	4·35	5·49
Meat and fish—						
9. Meat	15·03	18·51	22·36	26·83	26·96	31·41
10. Smoked pig meat	1·68	2·18	3·51	4·59	6·37	6·68
11. Fish	2·37	4·54	6·49	6·89	7·92	10·67
Fats—						
12. Animal	0·66	1·41	2·43	2·90	3·59	3·42
13. Vegetable	4·69	5·39	4·48	4·28	2·59	2·49
Vegetables—						
14. Potatoes	44·59	52·42	58·90	63·66	56·28	54·39
15. Other roots	1·83	1·95	2·60	3·45	2·94	7·30
16. Green	5·79	8·22	8·92	10·85	18·04	21·45
17. Dried	1·81	1·18	1·34	1·51	0·99	1·46
18. Canned	0·38	0·47	0·70	1·61	1·76	1·25
19. Other	2·32	2·82	4·98	7·23	7·68	10·31
Fruit—						
20. Fresh	3·03	6·57	12·01	17·61	28·52	47·38
21. Canned	0·26	0·85	2·20	4·30	5·01	5·74
22. Dried	0·22	0·56	0·81	1·57	1·90	2·82
Cereal products—						
23. Flour	3·90	9·52	14·60	16·78	17·89	12·95
24. Bread—white	46·32	46·54	46·11	42·45	39·14	38·41
25. Bread—brown	0·45	1·03	1·56	2·19	4·23	6·57
26. Rolls, buns and scones	0·45	0·65	1·47	2·32	1·95	2·96
27. Biscuits	0·48	1·31	1·95	2·69	2·49	3·65
28. Cake	1·33	2·13	3·59	5·21	7·43	7·57
29. Oatmeal and oatcakes	0·86	0·93	1·22	1·16	0·90	0·98
30. Other farinaceous	0·94	1·40	2·31	3·06	3·13	4·11
Sugar products—						
31. Sugar	9·86	12·65	15·05	17·25	19·74	20·26
32. Syrup and treacle	0·19	0·21	0·47	0·40	0·37	0·93
33. Jam and marmalade	1·29	2·32	3·12	3·62	5·02	7·23
Beverages—						
34. Chocolate, cocoa, etc.	0·15	0·27	0·33	0·31	0·54	0·49

TABLE 11

DIETARY SURVEY

Foodstuffs : Mean amount per head per week (oz.)

All Districts

Foodstuff	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Milk and milk products—						
1. Whole milk (pint)	0·44	1·16	2·32	3·09	4·14	5·44
2. Skimmed or buttermilk (pint)	nil	0·23	0·29	0·27	0·20	0·17
3. Condensed milk	4·49	4·32	3·44	2·00	1·95	0·49
4. Dried milk	nil	0·02	0·02	nil	0·09	0·07
5. Cream	nil	0·06	0·38	1·55	2·73	4·88
6. Butter	0·24	1·13	3·14	4·98	6·90	9·24
7. Cheese	0·78	1·25	1·90	2·15	2·38	2·47
Eggs—						
8. Hen and duck	1·11	1·70	2·76	3·53	4·37	5·58
Meat and fish—						
9. Meat	14·39	16·72	19·32	23·96	25·36	31·85
10. Smoked pig meat	1·59	1·76	2·49	3·37	4·27	5·44
11. Fish	2·42	4·32	5·84	7·02	7·87	10·31
Fats—						
12. Animal	0·69	1·17	1·91	2·27	2·55	2·83
13. Vegetable	4·78	4·94	3·64	3·49	2·13	2·30
Vegetables—						
14. Potatoes	42·02	51·41	60·01	62·71	59·52	56·79
15. Other roots	2·76	2·94	4·02	5·33	5·32	8·28
16. Green	4·68	5·94	6·04	7·57	11·81	13·26
17. Dried	1·94	1·68	1·90	2·03	1·77	1·71
18. Canned	0·58	0·44	0·55	1·34	1·26	1·51
19. Other	2·43	2·76	4·22	5·77	5·90	8·78
Fruit—						
20. Fresh	2·59	5·54	9·82	15·01	24·98	38·72
21. Canned	0·21	0·65	1·58	2·93	3·68	6·04
22. Dried	0·18	0·43	0·62	1·42	1·81	3·15
Cereal products—						
23. Flour	3·18	7·18	10·04	11·42	11·29	10·36
24. Bread—white	47·55	47·41	44·50	41·97	37·25	33·99
25. Bread—brown	0·91	1·10	1·61	2·34	4·18	5·41
26. Rolls, buns, and scones	1·30	3·45	6·22	7·88	9·18	6·65
27. Biscuits	0·47	1·34	2·24	3·23	3·80	4·30
28. Cake	1·16	2·04	3·37	5·33	7·35	8·09
29. Oatmeal and oatcakes	1·23	4·44	6·68	6·19	6·14	6·13
30. Other farinaceous	0·88	1·88	3·12	3·70	3·77	4·60
Sugar Products—						
31. Sugar	10·26	12·88	15·23	17·87	19·03	19·47
32. Syrup and treacle	0·42	0·95	1·55	1·29	1·13	2·07
33. Jam and marmalade	1·42	2·77	4·47	5·01	6·99	7·30
Beverages—						
34. Chocolate, cocoa, etc.	0·15	0·24	0·28	0·26	0·40	0·42

APPENDIX 3

TABLE 12

DIETARY SURVEY (SCOTLAND)

Nutrients : Mean amount per head per day

District : Aberdeen

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	—	1,910	2,437	2,535	3,042	3,504
2. Protein—animal (g.)	—	21·3	29·9	35·0	42·6	36·9
3. Protein—total (g.)	—	54·3	69·2	68·7	83·9	99·1
4. Carbohydrate (g.)	—	271·4	342·0	334·6	387·3	432·1
5. Fat (g.)	—	61·8	80·8	94·9	119·4	142·7
6. Calcium (g.)	—	0·395	0·631	0·849	0·861	0·993
7. Phosphorus (g.)	—	0·800	1·141	1·308	1·486	1·770
8. Iron (mg.)	—	8·62	11·89	12·54	14·51	16·32
9. Vitamin A (I.U.)	—	1,350	2,442	3,112	4,683	3,709
10. Vitamin B_1 (mg.)	—	0·67	1·08	1·20	1·50	1·85
11. Vitamin C (mg.)	—	18·5	34·4	44·0	63·7	62·0

District : Kintore

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	—	1,927	2,093	2,901	—	—
2. Protein—animal (g.)	—	23·5	30·8	35·6	—	—
3. Protein—total (g.)	—	57·0	59·9	81·3	—	—
4. Carbohydrate (g.)	—	300·1	320·8	458·2	—	—
5. Fat (g.)	—	49·8	57·2	74·1	—	—
6. Calcium (g.)	—	0·606	1·063	0·930	—	—
7. Phosphorus (g.)	—	1·055	1·356	1·581	—	—
8. Iron (mg.)	—	8·48	8·19	12·77	—	—
9. Vitamin A (I.U.)	—	1,458	2,180	6,056	—	—
10. Vitamin B_1 (mg.)	—	0·90	1·20	1·56	—	—
11. Vitamin C (mg.)	—	75·8	86·2	142·4	—	—

District : Hopeman

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	—	1,692	1,918	2,443	—	—
2. Protein—animal (g.)	—	20·2	24·1	34·6	—	—
3. Protein—total (g.)	—	49·7	52·4	70·7	—	—
4. Carbohydrate (g.)	—	258·4	283·3	328·7	—	—
5. Fat (g.)	—	46·2	58·3	86·7	—	—
6. Calcium (g.)	—	0·411	0·522	0·779	—	—
7. Phosphorus (g.)	—	0·794	0·893	1·254	—	—
8. Iron (mg.)	—	7·39	7·31	11·42	—	—
9. Vitamin A (I.U.)	—	1,124	1,520	4,013	—	—
10. Vitamin B_1 (mg.)	—	0·70	0·81	1·24	—	—
11. Vitamin C (mg.)		30·2	30·0	51·3	—	—

TABLE 12 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Nutrients: Mean amount per head per day

District: Barthol Chapel

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	—	2,358	2,682	3,248	3,741	3,911
2. Protein—animal (g.)	—	26·5	33·7	42·7	55·8	59·4
3. Protein—total (g.)	—	68·5	76·0	91·7	110·2	109·9
4. Carbohydrate (g.)	—	378·8	406·3	482·1	542·5	519·3
5. Fat (g.)	—	56·3	75·7	96·3	114·5	143·2
6. Calcium (g.)	—	0·923	0·975	1·250	1·387	1·427
7. Phosphorus (g.)	—	1·576	1·646	1·977	2·190	2·360
8. Iron (mg.)	—	11·97	11·65	14·72	14·86	16·94
9. Vitamin A (I.U.)	—	1,097	1,736	2,788	3,155	3,384
10. Vitamin B_1 (mg.)	—	1·37	1·40	1·64	1·76	1·85
11. Vitamin C (mg.)	—	69·1	100·5	107·2	119·6	109·4

District: Methlick

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	—	2,391	2,846	2,899	3,352	4,015
2. Protein—animal (g.)	—	23·1	35·4	40·8	44·4	74·7
3. Protein—total (g.)	—	67·2	81·0	81·1	89·2	120·4
4. Carbohydrate (g.)	—	399·6	441·1	420·5	461·0	542·1
5. Fat (g.)	—	51·3	75·4	90·9	117·8	139·6
6. Calcium (g.)	—	0·863	1·039	0·960	1·142	2·077
7. Phosphorus (g.)	—	1·514	1·767	1·604	1·894	2·748
8. Iron (mg.)	—	11·23	12·72	12·40	14·81	16·96
9. Vitamin A (I.U.)	—	1,352	2,233	3,205	3,831	5,589
10. Vitamin B_1 (mg.)	—	1·28	1·48	1·41	1·64	2·46
11. Vitamin C (mg.)	—	98·2	91·8	107·5	134·5	200·4

District: Tarves

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	—	2,426	2,744	3,070	2,959	3,100
2. Protein—animal (g.)	—	29·1	35·4	46·4	46·1	50·2
3. Protein—total (g.)	—	72·5	80·2	91·0	84·8	86·8
4. Carbohydrate (g.)	—	389·5	423·1	431·5	397·9	375·4
5. Fat (g.)	—	57·1	72·9	99·8	105·3	129·2
6. Calcium (g.)	—	0·903	1·024	1·116	1·072	1·111
7. Phosphorus (g.)	—	1·592	1·725	1·849	1·690	1·569
8. Iron (mg.)	—	12·88	13·91	15·22	14·28	15·25
9. Vitamin A (I.U.)	—	1,320	1,627	2,622	2,153	3,021
10. Vitamin B_1 (mg.)	—	1·39	1·50	1·54	1·55	1·58
11. Vitamin C (mg.)	—	36·3	41·2	46·6	71·0	52·4

TABLE 12 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Nutrients : Mean amount per head per day

District : West Wemyss

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	—	1,806	2,201	2,633	2,986	3,179
2. Protein—animal (g.)	—	15·3	20·1	23·7	32·2	37·7
3. Protein—total (g)	—	48·0	59·6	71·1	84·0	85·9
4. Carbohydrate (g.)	—	267·4	315·8	383·3	414·2	430·8
5. Fat (g.)	—	55·1	71·2	82·8	101·5	114·1
6. Calcium (g.)	—	0·317	0·438	0·450	0·622	0·775
7. Phosphorus g.	—	0·634	0·883	1·020	1·254	1·299
8. Iron (mg.)	—	8·08	11·21	12·37	14·69	15·71
9. Vitamin A (I.U.)	—	1,268	1,762	2,066	2,650	2,841
10. Vitamin B_1 (mg.)	—	0·61	0·94	1·06	1·27	1·57
11. Vitamin C (mg.)	—	15·8	31·2	31·3	40·7	53·9

District : Coaltown of Wemyss

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	—	1,782	2,404	2,722	2,907	3,538
2. Protein—animal (g.)	—	14·8	20·3	27·6	33·8	56·1
3. Protein—total (g.)	—	51·0	65·6	71·4	78·5	101·0
4. Carbohydrate (g.)	—	269·5	370·0	386·5	407·0	418·2
5. Fat (g.)	—	50·3	66·4	90·8	98·5	151·5
6. Calcium (g.)	—	0·335	0·520	0·567	0·683	0·890
7. Phosphorus (g.)	—	0·719	1·000	1·093	1·274	1·602
8. Iron (mg.)	—	8·67	11·91	12·49	14·71	17·19
9. Vitamin A (I.U.)	—	1,339	1,859	2,475	2,846	4,454
10. Vitamin B_1 (mg.)	—	0·73	1·00	1·10	1·38	1·64
11. Vitamin C (mg.)	—	14·3	29·7	37·1	53·2	47·0

District: Dundee

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,578	1,872	2,335	2,770	2,889	3,067
2. Protein—animal (g.)	15·0	17·1	25·4	33·8	38·9	56·1
3. Protein—total (g.)	41·2	52·0	65·7	75·1	77·4	88·6
4. Carbohydrate (g.)	251·6	289·6	335·9	387·1	377·8	359·2
5. Fat (g.)	40·5	50·7	74·1	93·8	110·0	132·5
6. Calcium (g.)	0·329	0·368	0·510	0·656	0·838	0·908
7. Phosphorus (g.)	0·621	0·753	0·951	1·216	1·346	1·484
8. Iron (mg.)	8·30	9·51	12·00	13·65	12·94	15·85
9. Vitamin A (I.U.)	1,242	1,372	1,934	3,139	2,974	4,225
10. Vitamin B_1 (mg.)	0·63	0·78	1·01	1·35	1·36	1·62
11. Vitamin C (mg.)	19·5	20·9	31·9	38·6	34·9	63·5

TABLE 12 (*cont.*)

DIETARY SURVEY (SCOTLAND)

Nutrients : Mean amount per head per day

District : Edinburgh

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,558	2,075	2,483	2,982	—	—
2. Protein—animal (g.)	15·2	22·3	27·6	43·4	—	—
3. Protein—total (g.)	45·3	60·0	70·8	86·6	—	—
4. Carbohydrate (g.)	238·4	312·1	364·3	394·8	—	—
5. Fat (g.)	42·4	59·0	73·7	108·4	—	—
6. Calcium (g.)	0·283	0·390	0·535	0·413	—	—
7. Phosphorus (g.)	0·646	0·862	1·092	1·142	—	—
8. Iron (mg.)	8·23	10·48	13·51	16·25	—	—
9. Vitamin A (I.U.)	592	1,283	2,034	2,068	—	—
10. Vitamin B_1 (mg.)	0·67	0·87	1·10	1·20	—	—
11. Vitamin C (mg.)	12·7	20·3	28·1	28·5	—	—

APPENDIX 3

TABLE 13

DIETARY SURVEY (ENGLAND)

Nutrients : Mean amount per head per day

District : Barrow

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,405	1,709	2,232	2,494	2,707	3,321
2. Protein—animal (g.)	11·6	17·5	24·6	32·2	36·4	51·2
3. Protein—total (g.)	34·6	43·8	58·7	66·5	71·4	89·7
4. Carbohydrate (g.)	213·2	246·3	311·6	329·9	338·0	396·4
5. Fat (g.)	41·7	55·8	76·8	93·3	110·5	142·8
6. Calcium (g.)	0·234	0·301	0·417	0·547	0·628	0·916
7. Phosphorus (g.)	0·527	0·646	0·893	1·081	1·137	1·606
8. Iron (mg.)	5·55	7·15	9·89	11·90	12·17	15·52
9. Vitamin A (I.U.)	1,019	1,262	2,409	4,134	3,437	4,318
10. Vitamin B_1 (mg.)	0·46	0·63	0·89	1·15	1·31	1·68
11. Vitamin C (mg.)	18·3	25·9	37·3	49·5	55·2	83·5

District : Liverpool

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,673	2,020	2,417	2,103	2,568	2,895
2. Protein—animal (g.)	18·4	21·4	30·7	29·6	40·4	44·1
3. Protein—total (g.)	48·8	54·6	66·8	54·0	65·9	78·0
4. Carbohydrate (g.)	248·9	288·7	320·8	255·0	297·9	347·3
5. Fat (g.)	48·6	65·9	88·9	89·6	115·9	123·9
6. Calcium (g.)	0·267	0·351	0·464	0·636	0·803	0·888
7. Phosphorus (g.)	0·710	0·793	1·014	0·985	1·214	1·407
8. Iron (mg.)	8·47	8·99	11·21	10·43	11·23	17·88
9. Vitamin A (I.U.)	1,480	1,831	2,838	2,968	3,414	5,151
10. Vitamin B_1 (mg.)	0·73	0·79	1·03	1·20	1·43	1·73
11. Vitamin C (mg.)	39·4	35·0	41·0	64·4	57·4	87·4

District : Yorkshire, West Riding

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,757	1,978	2,401	2,955	4,062	3,878
2. Protein—animal (g.)	9·9	18·3	25·4	34·7	41·6	42·9
3. Protein—total (g.)	45·9	50·5	62·5	80·2	103·0	90·6
4. Carbohydrate (g.)	279·0	273·2	318·8	382·3	536·2	484·0
5. Fat (g.)	45·7	70·0	90·5	113·9	155·2	163·8
6. Calcium (g.)	0·132	0·296	0·399	0·500	0·619	0·780
7. Phosphorus (g.)	0·528	0·700	0·887	1·129	1·430	1·462
8. Iron (mg.)	6·36	7·39	9·51	11·90	15·51	13·19
9. Vitamin A (I.U.)	518	1,273	1,813	2,689	3,067	3,170
10. Vitamin B_1 (mg.)	0·50	0·69	0·89	1·31	1·40	2·24
11. Vitamin C (mg.)	12·1	22·0	29·5	43·0	37·4	51·9

TABLE 13 (*cont.*)

DIETARY SURVEY (ENGLAND)

Nutrients : Mean amount per head per day

District : Wisbech

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,566	2,111	2,524	2,952	3,273	4,039
2. Protein—animal (g.)	12·5	18·4	27·9	34·3	41·6	53·1
3. Protein—total (g.)	42·7	52·8	65·6	75·4	83·9	103·7
4. Carbohydrate (g.)	243·9	315·3	349·5	396·7	428·1	503·1
5. Fat (g.)	42·0	64·7	88·3	109·2	126·3	166·8
6. Calcium (g.)	0·231	0·351	0·543	0·640	0·720	0·972
7. Phosphorus (g.)	0·582	0·751	1·015	1·176	1·325	1·649
8. Iron (mg.)	6·96	8·47	10·45	12·57	13·87	17·35
9. Vitamin A (I.U.)	1,205	1,833	2,465	2,883	3,661	4,699
10. Vitamin B_1 mg.	0·53	0·74	1·02	1·26	1·48	1·70
11. Vitamin C (mg.)	26·2	30·3	45·6	49·6	64·9	53·1

District : Fulham

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,453	1,814	2,185	2,264	2,455	2,824
2. Protein—animal (g.)	16·7	21·6	31·1	33·9	37·5	46·8
3. Protein—total (g.)	34·2	48·3	59·4	61·3	65·5	78·1
4. Carbohydrate (g.)	195·9	253·0	284·5	279·7	299·3	337·1
5. Fat (g.)	54·7	62·2	83·4	93·3	103·2	120·7
6. Calcium (g.)	0·205	0·327	0·500	0·610	0·753	0·800
7. Phosphorus (g.)	0·507	0·711	0·936	1·035	1·162	1·366
8. Iron (mg.)	7·03	8·63	10·76	10·80	11·26	13·56
9. Vitamin A (I.U.)	780	1,919	2,392	2,618	3,377	4,524
10. Vitamin B_1 (mg.)	0·65	0·71	0·88	1·08	1·27	1·53
11. Vitamin C (mg.)	74·9	63·7	73·8	79·1	96·9	108·3

District : Bethnal Green

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,402	1,795	2,269	2,585	2,968	3,237
2. Protein—animal (g.)	14·8	21·6	30·0	36·5	41·6	53·9
3. Protein—total (g.)	37·6	49·0	64·1	73·0	78·6	91·0
4. Carbohydrate (g.)	200·2	245·4	301·6	326·8	353·1	390·8
5. Fat (g.)	45·9	63·2	82·8	101·6	128·8	135·7
6. Calcium (g.)	0·247	0·330	0·462	0·568	0·719	0·761
7. Phosphorus (g.)	0·530	0·702	0·935	1·093	1·267	1·381
8. Iron (mg.)	7·02	8·88	11·28	12·65	14·84	14·79
9. Vitamin A (I.U.)	1,402	2,116	2,875	3,858	3,673	3,914
10. Vitamin B_1 (mg.)	0·55	0·74	0·99	1·17	1·52	1·46
11. Vitamin C (mg.)	24·7	34·9	45·4	55·7	65·0	70·1

APPENDIX 3

TABLE 14

DIETARY SURVEY

Nutrients : Mean amount per head per day

Scotland

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,565	2,067	2,468	2,835	3,044	3,303
2. Protein—animal (g.)	15·2	21·9	28·5	35·2	40·2	53·3
3. Protein—total (g.)	44·0	59·4	69·8	78·8	84·2	93·4
4. Carbohydrate (g.)	242·5	319·8	369·2	404·1	413·6	407·2
5. Fat (g.)	41·8	55·0	71·6	92·0	107·9	134·3
6. Calcium (g.)	0·297	0·534	0·727	0·796	0·890	1·045
7. Phosphorus (g.)	0·638	1·024	1·285	1·406	1·519	1·658
8. Iron (mg.)	8·26	10·35	12·00	13·33	14·37	15·94
9. Vitamin A (I.U.)	793	1,320	1,831	2,773	3,014	3,627
10. Vitamin B_1 (mg.)	0·66	0·96	1·19	1·32	1·46	1·69
11. Vitamin C (mg.)	14·8	30·3	44·2	57·1	67·5	64·5

England

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,483	1,891	2,341	2,660	2,950	3,228
2. Protein—animal (g.)	14·7	20·5	28·1	34·5	39·6	48·7
3. Protein—total (g.)	40·0	50·2	63·1	71·4	76·7	86·5
4. Carbohydrate (g.)	218·3	266·1	316·2	344·3	372·6	390·5
5. Fat (g.)	45·5	63·9	84·6	102·7	119·2	136·9
6. Calcium (g.)	0·243	0·330	0·465	0·584	0·716	0·870
7. Phosphorus (g.)	0·568	0·721	0·944	1·106	1·249	1·481
8. Iron (mg.)	7·07	8·52	10·56	12·08	12·86	15·58
9. Vitamin A (I.U.)	1,304	1,848	2,513	3,254	3,484	4,545
10. Vitamin B_1 (mg.)	0·57	0·73	0·96	1·20	1·39	1·65
11. Vitamin C (mg.)	28·0	34·5	43·5	55·1	69·9	84·3

All districts

Nutrient	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
1. Calories (no.)	1,499	1,950	2,393	2,736	2,997	3,264
2. Protein—animal (g.)	14·8	21·0	28·3	34·8	39·9	50·9
3. Protein—total (g.)	40·8	53·3	65·8	74·6	80·5	89·8
4. Carbohydrate (g.)	223·2	284·1	338·0	370·2	393·3	398·5
5. Fat (g.)	44·8	60·9	79·2	98·1	113·4	135·7
6. Calcium (g.)	0·254	0·399	0·573	0·676	0·804	0·954
7. Phosphorus (g.)	0·582	0·823	1·084	1·236	1·386	1·566
8. Iron (mg.)	7·31	9·14	11·15	12·62	13·62	15·76
9. Vitamin A (I.U.)	1,201	1,671	2,231	3,045	3,247	4,105
10. Vitamin B_1 (mg.)	0·59	0·81	1·04	1·25	1·42	1·67
11. Vitamin C (mg.)	25·4	33·1	43·7	56·0	68·7	74·8

TABLE 15

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(Rowett Research Institute Standard)

(*a*) **Scotland : Calories per day**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		2,273	2,522	2,341	2,527	2,738
Supply		1,910	2,437	2,535	3,042	3,504
Supply as per cent. of requirement		84·0	·96·6	108·3	120·4	128·0
Kintore—	—				—	—
Estimated requirement		2,354	2,300	2,975		
Supply		1,927	2,093	2,901		
Supply as per cent. of requirement		81·9	91·0	97·5		
Hopeman—	—				—	—
Estimated requirement		1,968	2,154	2,306		
Supply		1,692	1,918	2,443		
Supply as per cent. of requirement		86·0	89·0	105·9		
Barthol Chapel—	—					
Estimated requirement		2,062	2,495	2,615	2,522	2,815
Supply		2,358	2,682	3,248	3,741	3,911
Supply as per cent. of requirement		114·4	107·5	124·2	148·3	138·9
Methlick—	—					
Estimated requirement		2,183	2,483	2,933	2,406	2,942
Supply		2,391	2,846	2,899	3,352	4,015
Supply as per cent. of requirement		109·3	114·6	98·8	139·3	136·5
Tarves—	—					
Estimated requirement		2,218	2,557	2,501	2,683	2,458
Supply		2,426	2,744	3,070	2,959	3,100
Supply as per cent. of requirement		109·4	107·3	122·8	110·3	126·1
West Wemyss—	—					
Estimated requirement		2,186	2,402	2,606	2,803	2,620
Supply		1,806	2,201	2,633	2,986	3,179
Supply as per cent. of requirement		82·6	91·6	101·0	106·5	121·3
Coaltown of Wemyss—	—					
Estimated requirement		2,200	2,884	2,676	2,690	2,631
Supply		1,782	2,404	2,722	2,907	3,538
Supply as per cent. of requirement		81·0	83·4	101·7	108·1	134·5
Dundee—						
Estimated requirement	1,931	2,088	2,213	2,356	2,451	2,298
Supply	1,578	1,872	2,335	2,770	2,889	3,067
Supply as per cent. of requirement	81·7	89·7	105·5	117·6	117·9	133·5
Edinburgh—					—	—
Estimated requirement	2,014	2,135	2,436	2,520		
Supply	1,558	2,075	2,483	2,982		
Supply as per cent. of requirement	77·4	97·2	101·9	118·3		

APPENDIX 3

TABLE 15 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(Rowett Research Institute Standard)

(*b*) **England : Calories per day**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	2,335	2,191	2,430	2,450	2,648	2,720
Supply	1,405	1,709	2,232	2,494	2,707	3,321
Supply as per cent. of requirement	60·2	78·0	91·9	101·8	102·2	122·1
Liverpool—						
Estimated requirement	1,914	2,032	2,051	2,387	2,638	2,668
Supply	1,673	2,020	2,416	2,103	2,568	2,895
Supply as per cent. of requirement	87·4	99·4	117·8	88·1	97·3	108·5
Yorkshire : West Riding—						
Estimated requirement	1,664	2,059	2,176	2,368	2,519	3,079
Supply	1,757	1,978	2,401	2,955	4,062	3,878
Supply as per cent. of requirement	105·6	96·1	110·3	124·8	161·3	125·9
Wisbech—						
Estimated requirement	2,161	2,292	2,373	2,536	2,592	2,708
Supply	1,566	2,111	2,524	2,952	3,273	4,039
Supply as per cent. of requirement	72·5	92·1	106·4	116·4	126·3	149·2
Fulham—						
Estimated requirement	1,954	2,267	2,398	2,419	2,371	2,490
Supply	1,453	1,814	2,185	2,264	2,455	2,824
Supply as per cent. of requirement	74·4	80·0	91·1	93·6	103·5	113·4
Bethnal Green—						
Estimated requirement	2,112	2,103	2,237	2,406	2,228	2,671
Supply	1,402	1,795	2,269	2,585	2,968	3,237
Supply as per cent. of requirement	66·4	85·4	101·4	107·4	133·2	121·2

TABLE 16

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(Rowett Research Institute Standard)

(*a*) Scotland : Total protein (g. per day)

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		71	74	73	78	80
Supply		54·2	69·2	68·7	83·9	99·1
Supply as per cent. of requirement		76·3	93·5	94·1	107·6	136·4
Kintore—	—				—	—
Estimated requirement		71	66	74		
Supply		57·0	59·9	81·3		
Supply as per cent. of requirement		80·3	90·8	109·9		
Hopeman—	—				—	—
Estimated requirement		62	69	70		
Supply		49·7	52·4	70·7		
Supply as per cent. of requirement		80·2	75·9	101·0		
Barthol Chapel—	—					
Estimated requirement		61	72	70	67	71
Supply		68·5	76·0	91·7	110·2	109·9
Supply as per cent. of requirement		112·3	105·6	131·0	164·5	154·8
Methlick—	—					
Estimated requirement		65	72	78	67	86
Supply		67·2	81·0	81·1	89·2	120·4
Supply as per cent. of requirement		103·4	112·5	104·0	133·1	140·0
Tarves—	—					
Estimated requirement		67	74	69	75	71
Supply		72·5	80·2	91·0	84·8	86·8
Supply as per cent. of requirement		108·2	108·4	131·9	113·1	122·3
West Wemyss—	—					
Estimated requirement		65	71	74	76	73
Supply		48·0	59·6	71·1	84·0	85·9
Supply as per cent. of requirement		73·8	83·9	96·1	110·5	117·7
Coaltown of Wemyss—	—					
Estimated requirement		66	74	75	73	70
Supply		51·0	65·6	71·4	78·5	101·0
Supply as per cent. of requirement		77·3	88·6	95·2	107·5	144·3
Dundee—						
Estimated requirement	64	68	69	71	68	70
Supply	41·2	52·0	65·7	75·1	77·4	88·6
Supply as per cent. of requirement	64·4	76·5	95·2	105·8	113·8	126·6
Edinburgh—					—	—
Estimated requirement	67	68	74	76		
Supply	45·3	60·0	70·8	86·6		
Supply as per cent. of requirement	67·6	88·2	95·7	113·9		

APPENDIX 3

TABLE 16 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(Rowett Research Institute Standard)

(*b*) **England : Total protein (g. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	74	68	71	71	75	82
Supply	34·6	43·3	58·6	66·5	71·4	89·7
Supply as per cent. of requirement	46·8	63·7	82·5	93·7	95·2	109·4
Liverpool—						
Estimated requirement	64	65	65	73	79	82
Supply	48·6	54·3	66·6	54·0	65·9	78·0
Supply as per cent. of requirement	75·9	83·5	102·5	74·0	83·4	95·1
Yorkshire : West Riding—						
Estimated requirement	59	64	63	66	64	72
Supply	45·9	50·1	62·5	79·5	99·8	90·2
Supply as per cent. of requirement	77·8	78·3	99·2	120·4	155·9	125·3
Wisbech—						
Estimated requirement	68	70	70	71	74	73
Supply	42·7	52·8	65·6	75·4	83·9	103·7
Supply as per cent. of requirement	62·8	75·4	93·7	106·2	113·4	142·1
Fulham—						
Estimated requirement	60	70	70	68	70	76
Supply	34·2	48·3	59·4	61·3	65·5	78·0
Supply as per cent. of requirement	57·0	69·0	84·9	90·1	93·6	102·6
Bethnal Green—						
Estimated requirement	68	66	68	73	63	73
Supply	37·6	49·0	64·1	73·0	78·6	91·0
Supply as per cent. of requirement	55·3	74·2	94·3	100·0	124·8	124·7

TABLE 17

DIETARY SURVEY

Percentage of total calories derived from protein in expenditure groups according to district

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen	—	11·7	11·7	11·1	11·3	11·6
Kintore	—	12·1	11·8	11·5	—	—
Hopeman	—	12·1	11·2	11·9	—	—
Barthol Chapel	—	11·9	11·6	11·6	12·1	11·5
Methlick	—	11·5	11·7	11·5	10·9	12·3
Tarves	—	12·2	12·0	12·1	11·8	11·5
West Wemyss	—	10·9	11·1	11·1	11·5	11·1
Coaltown of Wemyss	—	11·7	11·2	10·8	11·1	11·7
Dundee	10·7	11·4	11·5	11·1	11·0	11·8
Edinburgh	11·9	11·9	11·8	11·9	—	—
Scotland	11·5	11·8	11·6	11·4	11·3	11·6
Barrow	10·1	10·5	10·8	10·9	10·8	11·1
Liverpool	12·0	11·1	11·3	10·5	10·5	11·1
Yorkshire	10·7	10·5	10·7	11·1	10·4	9·6
Wisbech	11·2	10·2	10·7	10·5	10·5	10·5
Fulham	9·6	10·9	11·2	11·1	11·0	11·3
Bethnal Green	11·0	11·2	11·6	11·6	10·8	11·5
England	11·1	10·9	11·1	11·0	10·7	11·0
All districts	11·2	11·2	11·3	11·2	11·0	11·3

APPENDIX 3

TABLE 18

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(Rowett Research Institute Standard)

(*a*) **Scotland : Calcium (g. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		0·98	0·98	0·89	0·92	0·85
Supply		0·395	0·631	0·849	0·861	0·993
Supply as per cent. of requirement		40·3	64·4	95·4	93·6	116·8
Kintore—	—				—	—
Estimated requirement		1·00	0·87	0·76		
Supply		0·606	1·063	0·930		
Supply as per cent. of requirement		60·6	122·2	122·4		
Hopeman—	—				—	—
Estimated requirement		0·92	0·95	0·93		
Supply		0·411	0·522	0·779		
Supply as per cent. of requirement		44·7	54·9	83·8		
Barthol Chapel—	—					
Estimated requirement		0·85	0·94	0·81	0·63	0·68
Supply		0·923	0·975	1·250	1·387	1·427
Supply as per cent. of requirement		108·6	103·7	154·3	220·2	209·9
Methlick—	—					
Estimated requirement		0·90	0·90	0·80	0·79	0·99
Supply		0·863	1·039	0·960	1·142	2·077
Supply as per cent. of requirement		95·9	115·4	120·0	144·6	209·8
Tarves—	—					
Estimated requirement		0·90	0·90	0·78	0·84	0·83
Supply		0·903	1·024	1·116	1·072	1·111
Supply as per cent. of requirement		100·3	113·8	143·1	127·6	133·9
West Wemyss—	—					
Estimated requirement		0·87	0·93	0·92	0·91	0·90
Supply		0·317	0·438	0·450	0·622	0·775
Supply as per cent. of requirement		36·4	47·1	48·9	68·4	86·1
Coaltown of Wemyss—	—					
Estimated requirement		0·90	0·99	0·94	0·84	0·76
Supply		0·335	0·520	0·567	0·683	0·890
Supply as per cent. of requirement		37·2	52·5	60·3	81·3	117·1
Dundee—						
Estimated requirement	0·90	0·94	0·87	0·85	0·73	0·70
Supply	0·329	0·368	0·510	0·656	0·838	0·908
Supply as per cent. of requirement	36·6	39·1	58·6	77·2	114·8	129·7
Edinburgh—					—	—
Estimated requirement	0·99	0·96	1·05	0·95		
Supply	0·283	0·390	0·535	0·413		
Supply as per cent. of requirement	28·6	40·6	51·0	43·5		

TABLE 18 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(Rowett Research Institute Standard)

(*b*) **England : Calcium (g. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	1·07	0·95	0·93	0·85	0·88	0·89
Supply	0·234	0·284	0·410	0·547	0·628	0·916
Supply as per cent. of requirement	21·9	29·8	44·1	64·4	71·4	102·9
Liverpool—						
Estimated requirement	0·94	0·95	0·91	0·90	0·87	0·94
Supply	0·262	0·341	0·456	0·636	0·802	0·882
Supply as per cent. of requirement	28·4	35·9	50·1	70·7	92·3	93·8
Yorkshire: West Riding—						
Estimated requirement	0·88	0·92	0·85	0·87	0·84	0·79
Supply	0·132	0·281	0·399	0·478	0·499	0·779
Supply as per cent. of requirement	15·0	30·5	46·9	54·9	59·4	98·6
Wisbech—						
Estimated requirement	0·98	0·97	0·87	0·85	0·88	0·79
Supply	0·231	0·351	0·543	0·640	0·720	0·972
Supply as per cent. of requirement	23·7	36·2	62·4	75·3	81·8	123·0
Fulham—						
Estimated requirement	0·75	0·94	0·88	0·80	0·82	0·86
Supply	0·205	0·327	0·500	0·610	0·753	0·800
Supply as per cent. of requirement	27·3	34·8	56·8	76·3	91·8	93·0
Bethnal Green—						
Estimated requirement	0·94	0·90	0·90	0·92	0·71	0·80
Supply	0·247	0·330	0·412	0·568	0·719	0·761
Supply as per cent. of requirement	26·3	36·7	51·3	61·7	101·3	95·1

APPENDIX 3

TABLE 19

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(Rowett Research Institute Standard)

(*a*) **Scotland: Vitamin B_1 (mg. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		1·37	1·52	1·40	1·52	1·64
Supply . . .		0·67	1·08	1·20	1·50	1·85
Supply as per cent. of requirement . .		49·0	71·1	85·3	98·8	112·4
Kintore—	—				—	—
Estimated requirement		1·41	1·38	1·79		
Supply . . .		0·90	1·20	1·56		
Supply as per cent of requirement . .		63·9	87·0	87·4		
Hopeman—	—				—	—
Estimated requirement		1·18	1·29	1·38		
Supply . . .		0·70	0·81	1·24		
Supply as per cent. of requirement . .		59·1	62·9	89·8		
Barthol Chapel—	—					
Estimated requirement		1·24	1·50	1·57	1·51	1·69
Supply . . .		1·37	1·40	1·64	1·76	1·85
Supply as per cent. of requirement . .		110·4	93·8	104·6	116·3	109·2
Methlick—	—					
Estimated requirement		1·31	1·49	1·76	1·44	1·76
Supply . . .		1·28	1·48	1·41	1·64	2·46
Supply as per cent. of requirement . .		97·3	99·4	80·2	113·7	139·6
Tarves—	—					
Estimated requirement		1·33	1·53	1·50	1·61	1·48
Supply . . .		1·39	1·50	1·54	1·55	1·58
Supply as per cent. of requirement . .		95·7	98·0	102·6	95·9	106·7
West Wemyss—	—					
Estimated requirement		1·31	1·44	1·56	1·38	1·57
Supply . . .		0·61	0·94	1·06	1·27	1·57
Supply as per cent. of requirement . .		46·7	65·0	67·6	92·1	100·0
Coaltown of Wemyss—	—					
Estimated requirement		1·32	1·73	1·61	1·61	1·58
Supply . . .		0·73	1·00	1·10	1·38	1·64
Supply as per cent. of requirement . .		55·0	58·1	69·0	85·5	104·0
Dundee—						
Estimated requirement	1·16	1·25	1·33	1·41	1·47	1·38
Supply . . .	0·63	0·78	1·01	1·35	1·36	1·62
Supply as per cent. of requirement . .	54·1	62·4	76·1	95·5	92·7	117·4
Edinburgh—					—	—
Estimated requirement	1·21	1·28	1·46	1·51		
Supply . . .	0·67	0·87	1·10	1·20		
Supply as per cent of requirement . .	55·6	67·9	75·2	79·2		

TABLE 19 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(Rowett Research Institute Standard)

(*b*) **England: Vitamin B_1 (mg. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	1·40	1·31	1·46	1·47	1·59	1·63
Supply . . .	0·46	0·63	0·89	1·15	1·31	1·68
Supply as per cent. of requirement . .	33·0	48·2	61·1	78·0	82·1	103·1
Liverpool—						
Estimated requirement	1·15	1·22	1·23	1·43	1·58	1·60
Supply . . .	0·73	0·79	1·03	1·20	1·43	1·73
Supply as per cent. of requirement . .	63·2	64·8	83·7	83·6	90·2	108·1
Yorkshire: West Riding						
Estimated requirement	1·00	1·24	1·31	1·42	1·51	1·85
Supply . . .	0·50	0·69	0·89	1·31	1·40	2·24
Supply as per cent. of requirement . .	49·5	55·6	68·0	92·2	92·9	120·9
Wisbech—						
Estimated requirement	1·30	1·37	1·43	1·52	1·55	1·63
Supply . . .	0·53	0·74	1·02	1·26	1·48	1·70
Supply as per cent. of requirement . .	41·2	53·7	71·6	82·6	95·0	104·8
Fulham—						
Estimated requirement	1·17	1·36	1·44	1·45	1·42	1·49
Supply . . .	0·65	0·71	0·88	1·08	1·27	1·53
Supply as per cent. of requirement . .	55·8	52·3	61·3	74·6	89·2	102·2
Bethnal Green—						
Estimated requirement	1·27	1·26	1·34	1·44	1·34	1·60
Supply . . .	0·55	0·74	0·99	1·17	1·52	1·46
Supply as per cent. of requirement . .	43·1	58·4	73·8	80·9	113·2	91·4

APPENDIX 3

TABLE 20

DIETARY SURVEY

Supplies of Vitamin A compared with Standard Allowance of 4,000 I.U. per day
(Rowett Research Institute Standard)

(*a*) Scotland

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Supply		1,350	2,442	3,112	4,683	3,709
Supply as per cent. of requirement		33·8	61·1	77·8	117·1	92·7
Kintore—	—				—	—
Supply		1,458	2,180	6,056		
Supply as per cent. of requirement		36·5	54·5	151·4		
Hopeman—	—				—	—
Supply		1,124	1,520	4,013		
Supply as per cent. of requirement		28·1	38·0	100·3		
Barthol Chapel—	—					
Supply		1,097	1,736	2,788	3,155	3,384
Supply as per cent. of requirement		27·4	43·4	69·7	78·9	84·6
Methlick—	—					
Supply		1,352	2,233	3,205	3,831	5,589
Supply as per cent. of requirement		33·8	55·8	80·1	95·8	139·7
Tarves—	—					
Supply		1,320	1,627	2,622	2,153	3,021
Supply as per cent. of requirement		33·0	40·7	65·6	53·8	75·5
West Wemyss—	—					
Supply		1,268	1,762	2,066	2,650	2,841
Supply as per cent. of requirement		31·7	44·1	51·7	66·3	71·0
Coaltown of Wemyss—	—					
Supply		1,339	1,859	2,475	2,846	4,454
Supply as per cent. of requirement		33·5	46·5	61·9	71·2	111·4
Dundee—						
Supply	1,242	1,372	1,934	3,139	2,974	4,225
Supply as per cent. of requirement	31·1	34·3	48·4	78·5	74·4	105·6
Edinburgh—					—	—
Supply	592	1,283	2,034	2,068		
Supply as per cent. of requirement	14·8	32·1	50·9	51·7		

(*b*) England

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Supply	1,019	1,262	2,409	4,134	3,437	4,318
Supply as per cent. of requirement	25·5	31·6	60·2	103·4	85·9	108·0
Liverpool—						
Supply	1,480	1,831	2,838	2,968	3,414	5,151
Supply as per cent. of requirement	37·0	45·8	71·0	74·2	85·4	128·8
Yorkshire : West Riding—						
Supply	518	1,273	1,813	2,689	3,067	3,170
Supply as per cent. of requirement	13·0	31·8	45·4	67·2	76·7	79·3
Wisbech—						
Supply	1,205	1,833	2,465	2,883	3,661	4,699
Supply as per cent. of requirement	30·1	45·8	61·6	72·1	91·5	117·5
Fulham—						
Supply	780	1,919	2,392	2,618	3,377	4,524
Supply as per cent. of requirement	19·5	48·0	59·8	65·5	84·4	113·1
Bethnal Green—						
Supply	1,402	2,116	2,875	3,858	3,673	3,914
Supply as per cent. of requirement	35·1	52·9	71·9	96·5	91·8	97·9

TABLE 21

DIETARY SURVEY

Supplies of Vitamin C compared with Standard Allowance of 75 mg. per day
(Rowett Research Institute Standard)

(*a*) **Scotland**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Supply		18·5	34·4	44·0	63·7	62·0
Supply as per cent. of requirement		24·7	45·9	58·6	84·9	82·6
Kintore—	—				—	—
Supply		75·8	86·2	142·4		
Supply as per cent. of requirement		101·0	114·9	189·8		
Hopeman—	—				—	—
Supply		30·2	30·0	51·3		
Supply as per cent of requirement		40·2	40·0	68·4		
Barthol Chapel—	—					
Supply		69·1	100·5	107·2	119·6	109·4
Supply as per cent. of requirement		92·1	134·0	142·9	159·4	145·9
Methlick—	—					
Supply		98·2	91·8	107·5	134·5	200·4
Supply as per cent. of requirement		130·9	122·4	143·3	179·3	267·2
Tarves—	—					
Supply		36·3	41·2	46·6	71·0	52·4
Supply as per cent. of requirement		48·4	54·9	62·1	94·7	69·9
West Wemyss—	—					
Supply		15·8	31·2	31·3	40·7	53·9
Supply as per cent. of requirement		21·1	41·6	41·7	54·2	71·8
Coaltown of Wemyss—	—					
Supply		14·3	29·7	37·1	53·2	47·0
Supply as per cent. of requirement		19·1	39·6	49·5	70·9	62·6
Dundee—						
Supply	19·5	20·9	31·9	38·6	34·9	63·5
Supply as per cent. of requirement	25·9	27·9	42·5	51·4	46·5	84·7
Edinburgh—					—	—
Supply	12·7	20·3	28·1	28·5		
Supply as per cent. of requirement	16·9	27·0	37·5	37·9		

APPENDIX 3

TABLE 21 (*cont.*)

DIETARY SURVEY

Supplies of Vitamin C compared with Standard Allowance of 75 mg. per day
(Rowett Research Institute Standard)

(*b*) **England**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Supply	18·3	25·9	37·3	49·5	55·2	83·5
Supply as per cent. of requirement	24·4	34·5	49·7	66·0	73·5	111·3
Liverpool—						
Supply	39·4	35·0	41·0	64·4	57·4	87·4
Supply as per cent. of requirement	52·5	46·7	54·6	85·8	76·5	116·5
Yorkshire : West Riding—						
Supply	12·1	22·0	29·5	43·0	37·4	51·9
Supply as per cent. of requirement	16·1	29·3	39·3	57·3	49·9	69·2
Wisbech—						
Supply	26·2	30·3	45·6	49·6	64·9	53·1
Supply as per cent. of requirement	34·9	40·4	60·7	66·1	86·5	70·7
Fulham—						
Supply	74·9	63·7	73·8	79·1	96·8	108·3
Supply as per cent. of requirement	99·8	84·9	98·3	105·5	129·1	144·3
Bethnal Green—						
Supply	24·7	34·9	45·4	55·7	65·0	70·1
Supply as per cent. of requirement	32·9	46·5	60·5	74·3	86·7	93·5

TABLE 22

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(B.M.A. Standards)

(*a*) **Scotland: Calories (per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		2,179	2,425	2,213	2,440	2,552
Supply		1,847	2,356	2,452	2,940	3,386
Supply as per cent. of requirement		84·8	97·2	110·8	120·5	132·7
Kintore—	—				—	—
Estimated requirement		2,218	2,167	2,750		
Supply		1,864	2,024	2,806		
Supply as per cent. of requirement		84·0	93·4	102·0		
Hopeman—	—				—	—
Estimated requirement		2,019	2,114	2,190		
Supply		1,637	1,855	2,362		
Supply as per cent. of requirement		81·1	87·7	107·9		
Barthol Chapel—	—					
Estimated requirement		2,035	2,346	2,484	2,417	2,596
Supply		2,280	2,593	3,141	3,616	3,780
Supply as per cent. of requirement		112·0	110·5	126·4	149·6	145·6
Methlick—	—					
Estimated requirement		2,165	2,373	2,678	2,318	2,667
Supply		2,313	2,748	2,806	3,241	3,879
Supply as per cent. of requirement		106·8	115·8	104·8	139·8	145·4
Tarves—	—					
Estimated requirement		2,184	2,403	2,383	2,524	2,339
Supply		2,345	2,651	2,967	2,859	2,992
Supply as per cent. of requirement		107·4	110·3	124·5	113·3	127·9
West Wemyss—	—					
Estimated requirement		2,208	2,341	2,500	2,702	2,529
Supply		1,747	2,129	2,546	2,887	3,074
Supply as per cent. of requirement		79·1	90·9	101·8	106·8	121·6
Coaltown of Wemyss—	—					
Estimated requirement		2,208	2,507	2,542	2,588	2,552
Supply		1,723	2,325	2,632	2,810	3,417
Supply as per cent. of requirement		78·0	92·7	103·5	108·6	133·9
Dundee—	—					
Estimated requirement	1,911	2,075	2,193	2,276	2,368	2,258
Supply	1,526	1,811	2,258	2,676	2,793	2,963
Supply as per cent. of requirement	79·9	87·3	103·0	117·6	117·9	131·2
Edinburgh—					—	—
Estimated requirement	2,004	2,095	2,354	2,386		
Supply	1,506	2,006	2,387	2,881		
Supply as per cent. of requirement	75·1	95·8	101·4	120·7		

TABLE 22 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(B.M.A. Standards)

(*b*) **England: Calories (per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	2,255	2,154	2,323	2,373	2,570	2,552
Supply	1,359	1,653	2,159	2,410	2,616	3,209
Supply as per cent. of requirement	60·3	76·7	92·9	101·6	101·8	125·7
Liverpool—						
Estimated requirement	1,949	2,063	2,061	2,350	2,475	2,519
Supply	1,617	1,954	2,335	2,030	2,483	2,784
Supply as per cent. of requirement	83·0	94·7	113·3	86·4	100·3	110·5
Yorkshire: West Riding—						
Estimated requirement	1,821	2,094	2,180	2,346	2,553	2,893
Supply	1,700	1,913	2,325	2,857	3,930	3,752
Supply as per cent. of requirement	93·4	91·4	106·7	121·8	153·9	129·7
Wisbech—						
Estimated requirement	2,111	2,206	2,291	2,414	2,422	2,507
Supply	1,515	2,043	2,440	2,854	3,165	3,905
Supply as per cent. of requirement	71·8	92·6	106·5	118·2	130·7	155·8
Fulham—						
Estimated requirement	1,938	2,187	2,336	2,330	2,309	2,393
Supply	1,405	1,754	2,113	2,190	2,373	2,729
Supply as per cent. of requirement	72·5	80·2	90·5	94·0	102·8	114·0
Bethnal Green—						
Estimated requirement	2,083	2,080	2,197	2,320	2,179	2,518
Supply	1,356	1,735	2,193	2,497	2,868	3,128
Supply as per cent. of requirement	65·1	83·4	99·8	107·6	131·6	124·2

TABLE 23

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups (B.M.A. Standards)

(*a*) Scotland: Total protein (g. per day)

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		76	83	74	80	81
Supply		54·2	69·2	68·7	83·9	99·1
Supply as per cent. of requirement		71·3	83·4	92·8	104·9	122·3
Kintore—	—				—	—
Estimated requirement		77	73	86		
Supply		57·0	59·9	81·3		
Supply as per cent. of requirement		74·0	82·1	94·5		
Hopeman	—				—	—
Estimated requirement		70	73	75		
Supply		49·7	52·4	70·7		
Supply as per cent. of requirement		71·0	71·8	94·3		
Barthol Chapel—	—					
Estimated requirement		69	79	80	74	80
Supply		68·5	76·0	91·7	110·2	109·9
Supply as per cent, of requirement		99·3	96·2	114·6	148·9	137·4
Methlick—	—					
Estimated requirement		75	79	84	74	89
Supply		67·2	81·0	81·1	89·2	120·4
Supply as per cent. of requirement		89·6	102·5	96·5	120·5	135·3
Tarves—	—					
Estimated requirement		74	80	77	81	76
Supply		72·5	80·2	91·0	84·8	86·8
Supply as per cent. of requirement		98·0	100·3	118·2	104·7	114·2
West Wemyss—	—					
Estimated requirement		75	79	83	88	84
Supply		48·0	59·6	71·1	84·0	85·9
Supply as per cent. of requirement		64·0	75·4	85·7	95·5	102·3
Coaltown of Wemyss—	—					
Estimated requirement		75	86	85	84	80
Supply		51·0	65·6	71·4	78·5	101·0
Supply as per cent. of requirement		68·0	76·3	84·0	93·5	126·3
Dundee						
Estimated requirement	66	72	74	75	75	70
Supply	41·2	52·0	65·7	75·1	77·4	88·6
Supply as per cent. of requirement	62·4	72·2	88·8	100·1	103·2	126·6
Edinburgh—					—	—
Estimated requirement	72	73	82	79		
Supply	45·3	60·0	70·8	86·6		
Supply as per cent. of requirement	62·9	82·2	86·3	109·6		

APPENDIX 3

TABLE 23 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(B.M.A. Standards)

(*b*) **England: Total protein (g. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	80	75	79	78	84	83
Supply	34·6	43·3	58·6	66·5	71·4	89·7
Supply as per cent. of requirement	43·3	57·7	74·2	85·3	85·0	108·1
Liverpool—						
Estimated requirement	63	73	71	78	80	82
Supply	48·6	54·3	66·6	54·0	65·9	78·0
Supply as per cent. of requirement	77·1	74·4	93·8	69·2	82·4	95·1
Yorkshire: West Riding—						
Estimated requirement	65	72	73	77	83	89
Supply	45·9	50·1	62·5	79·5	99·8	90·2
Supply as per cent. of requirement	70·6	69·6	85·6	103·2	120·2	101·3
Wisbech—						
Estimated requirement	74	76	76	79	79	80
Supply	42·7	52·8	65·6	75·4	83·9	103·7
Supply as per cent. of requirement	57·7	69·5	86·3	95·4	106·2	129·6
Fulham—						
Estimated requirement	63	75	77	75	75	77
Supply	34·2	48·3	59·4	61·3	65·5	78·0
Supply as per cent. of requirement	45·7	64·4	77·1	81·7	87·3	101·3
Bethnal Green—						
Estimated requirement	72	71	74	78	69	80
Supply	37·6	49·0	64·1	73·0	78·6	91·0
Supply as per cent. of requirement	52·2	69·0	86·6	93·6	113·9	113·8

TABLE 24

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(B.M.A. Standards)

(*a*) **Scotland: Calcium (g. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		1·03	1·01	0·96	0·98	0·92
Supply . . .		0·395	0·631	0·849	0·861	0·993
Supply as per cent. of requirement . .		38·3	62·5	88·4	87·9	107·9
Kintore—	—				—	—
Estimated requirement		1·04	0·93	0·92		
Supply . . .		0·606	1·063	0·930		
Supply as per cent. of requirement . .		58·3	114·3	101·1		
Hopeman—	—				—	—
Estimated requirement		1·00	0·98	0·99		
Supply . . .		0·411	0·522	0·779		
Supply as per cent. of requirement . .		41·1	53·3	78·7		
Barthol Chapel—	—					
Estimated requirement		0·95	0·98	0·94	0·84	0·86
Supply . . .		0·923	0·975	1·250	1·387	1·427
Supply as per cent. of requirement . .		97·2	99·5	133·0	165·1	165·9
Methlick—	—					
Estimated requirement		0·97	0·97	0·91	0·91	1·00
Supply . . .		0·863	1·039	0·960	1·142	2·077
Supply as per cent. of requirement . .		89·0	107·1	105·5	125·5	207·7
Tarves—	—					
Estimated requirement		0·98	0·97	0·92	0·95	0·92
Supply . . .		0·903	1·024	1·116	1·072	1·111
Supply as per cent. of requirement . .		92·1	105·6	121·3	112·8	120·8
West Wemyss—	—					
Estimated requirement		0·95	0·99	0·96	0·99	0·96
Supply . . .		0·217	0·438	0·450	0·622	0·775
Supply as per cent. of requirement . .		33·4	44·2	46·9	62·8	80·7
Coaltown of Wemyss—	—					
Estimated requirement		0·97	1·01	0·99	0·95	0·89
Supply . . .		0·335	0·520	0·567	0·683	0·890
Supply as per cent. of requirement . .		34·5	51·5	57·3	71·9	100·0
Dundee—						
Estimated requirement	0·97	1·02	1·02	0·93	0·89	0·86
Supply . . .	0·329	0·368	0·510	0·656	0·838	0·908
Supply as per cent. of requirement . .	33·9	36·1	50·0	70·5	94·2	105·6
Edinburgh—					—	—
Estimated requirement	1·00	1·00	1·01	0·95		
Supply . . .	0·283	0·390	0·535	0·413		
Supply as per cent. of requirement . .	28·3	39·0	53·0	43·5		

APPENDIX 3

TABLE 24 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(B.M.A. Standards)

(*b*) **England: Calcium (g. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	1·06	0·99	1·01	0·96	0·96	0·94
Supply . . .	0·234	0·284	0·410	0·547	0·628	0·916
Supply as per cent. of requirement . .	22·1	28·6	40·6	57·0	65·4	97·4
Liverpool—						
Estimated requirement	1·05	1·00	0·99	0·97	0·95	0·97
Supply . . .	0·262	0·341	0·456	0·636	0·802	0·882
Supply as per cent. of requirement . .	25·0	34·1	46·1	65·6	84·4	90·9
Yorkshire: West Riding—						
Estimated requirement	0·98	1·00	0·94	0·92	0·93	0·94
Supply . . .	0·132	0·281	0·399	0·478	0·499	0·779
Supply as per cent. of requirement . .	13·5	28·1	42·4	52·0	53·7	82·9
Wisbech—						
Estimated requirement	1·02	1·01	0·95	0·95	0·94	0·91
Supply . . .	0·231	0·351	0·543	0·640	0·720	0·972
Supply as per cent. of requirement . .	22·6	34·8	57·2	67·4	76·6	106·8
Fulham—						
Estimated requirement	0·91	1·01	0·96	0·93	0·96	0·92
Supply . . .	0·205	0·327	0·500	0·500	0·753	0·800
Supply as per cent. of requirement . .	22·5	32·4	52·1	65·6	78·4	87·0
Bethnal Green						
Estimated requirement	1·00	1·00	0·98	0·97	0·89	0·93
Supply . . .	0·247	0·330	0·412	0·568	0·719	0·761
Supply as per cent. of requirement . .	24·7	33·0	42·0	58·6	80·8	81·8

TABLE 25

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups (B.M.A. Standards)

(*a*) **Scotland: Vitamin A (I.U. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		3,765	4,018	4,000	4,280	4,655
Supply		1,350	2,442	3,112	4,683	3,709
Supply as per cent. of requirement		35·9	60·8	77·8	109·4	79·7
Kintore—	—				—	—
Estimated requirement		3,641	3,667	4,250		
Supply		1,458	2,180	6,056		
Supply as per cent. of requirement		40·0	59·4	142·4		
Hopeman—	—				—	—
Estimated requirement		3,872	3,937	3,667		
Supply		1,124	1,520	4,013		
Supply as per cent. of requirement		29·0	38·6	109·4		
Barthol Chapel—	—					
Estimated requirement		3,791	3,982	4,165	4,556	4,538
Supply		1,097	1,736	2,788	3,155	3,384
Supply as per cent. of requirement		28·9	43·6	66·9	69·2	74·6
Methlick—	—					
Estimated requirement		3,727	4,029	4,458	4,152	4,333
Supply		1,352	2,233	3,205	3,831	5,589
Supply as per cent. of requirement		36·3	55·4	71·9	92·3	129·0
Tarves—	—					
Estimated requirement		3,767	3,986	4,203	4,377	4,196
Supply		1,320	1,627	2,622	2,153	3,021
Supply as per cent. of requirement		35·0	40·8	62·4	49·1	72·0
West Wemyss—	—					
Estimated requirement		3,889	3,869	4,089	4,327	4,059
Supply		1,268	1,762	2,066	2,650	2,841
Supply as per cent. of requirement		32·6	45·5	50·5	61·2	70·0
Coaltown of Wemyss—	—					
Estimated requirement		3,833	3,889	4,000	4,176	4,333
Supply		1,339	1,859	2,475	2,846	4,454
Supply as per cent. of requirement		34·9	47·8	61·9	68·2	102·8
Dundee—						
Estimated requirement	3,516	3,780	4,184	4,345	4,382	4,515
Supply	1,242	1,372	1,934	3,139	2,974	4,225
Supply as per cent. of requirement	35·3	36·3	46·2	72·2	67·9	93·6
Edinburgh—					—	—
Estimated requirement	3,710	3,778	3,937	4,091		
Supply	592	1,283	2,034	2,068		
Supply as per cent. of requirement	16·0	34·0	51·7	50·5		

TABLE 25 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups (B.M.A Standards)

(*b*) **England: Vitamin A (I.U. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	3,898	3,806	3,939	4,116	4,250	4,256
Supply	1,019	1,262	2,409	4,134	3,437	4,318
Supply as per cent. of requirement	26·1	33·2	61·2	100·4	80·9	98·6
Liverpool—						
Estimated requirement	3,899	3,932	3,957	3,880	4,400	4,385
Supply	1,480	1,831	2,838	2,968	3,414	5,151
Supply as per cent. of requirement	38·0	46·6	71·7	76·5	77·6	117·5
Yorkshire: West Riding—						
Estimated requirement	4,000	3,928	4,148	4,346	4,632	4,857
Supply	518	1,273	1,813	2,689	3,067	3,170
Supply as per cent. of requirement	13·0	32·4	43·7	61·9	66·2	65·3
Wisbech—						
Estimated requirement	3,770	3,846	3,988	4,175	4,291	4,417
Supply	1,205	1,833	2,465	2,883	3,661	4,699
Supply as per cent. of requirement	32·0	47·7	61·8	69·1	85·3	106·4
Fulham—						
Estimated requirement	3,833	3,843	4,167	4,347	4,412	4,459
Supply	780	1,919	2,392	2,618	3,377	4,524
Supply as per cent. of requirement	20·3	49·9	57·4	60·2	76·5	101·5
Bethnal Green—						
Estimated requirement	3,793	3,923	4,093	4,095	4,143	4,286
Supply	1,402	2,116	2,875	3,858	3,673	3,914
Supply as per cent. of requirement	37·0	53·9	70·2	94·2	88·7	91·3

TABLE 26

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups (B.M.A. Standards)

(*a*) **Scotland: Vitamin C (mg. per day)**

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Aberdeen—	—					
Estimated requirement		21·3	22·5	20·8	22·2	22·6
Supply		18·5	34·4	44·0	63·7	62·0
Supply as per cent. of requirement.		86·9	152·9	211·5	286·9	274·3
Kintore—	—				—	—
Estimated requirement		21·2	19·2	22·5		
Supply		75·8	86·2	142·4		
Supply as per cent. of requirement		357·5	449·0	632·9		
Hopeman—	—				—	—
Estimated requirement		20·6	20·9	20·7		
Supply		30·2	30·0	51·3		
Supply as per cent. of requirement		146·6	143·5	247·8		
Barthol Chapel—	—					
Estimated requirement		19·3	21·9	20·9	19·4	20·4
Supply		69·1	100·5	107·2	119·6	109·4
Supply as per cent of requirement		358·0	458·9	512·9	616·5	536·3
Methlick—	—					
Estimated requirement		20·8	21·1	22·1	19·7	23·3
Supply		98·2	91·8	107·5	134·5	200·4
Supply as per cent. of requirement		472·1	435·1	486·4	682·7	860·1
Tarves—	—					
Estimated requirement		20·5	21·3	20·4	21·8	21·2
Supply		36·3	41·2	46·6	71·0	52·4
Supply as per cent. of requirement		177·1	193·4	228·4	325·7	247·2
West Wemyss—	—					
Estimated requirement		20·3	21·2	21·9	22·3	21·8
Supply		15·8	31·2	31·3	40·7	53·9
Supply as per cent. of requirement		77·8	147·2	142·9	182·5	247·2
Coaltown of Wemyss—	—					
Estimated requirement		20·2	22·4	22·6	21·2	20·8
Supply		14·3	29·7	37·1	53·2	47·0
Supply as per cent. of requirement		70·8	132·6	164·1	250·9	226·0
Dundee—						
Estimated requirement	18·7	21·0	21·2	20·9	20·4	19·7
Supply	19·5	20·9	31·9	38·6	34·9	63·5
Supply as per cent. of requirement	104·3	99·5	150·5	184·7	171·1	322·3
Edinburgh—					—	—
Estimated requirement	21·1	20·9	23·4	22·3		
Supply	12·7	20·3	28·1	28·5		
Supply as per cent. of requirement	60·2	97·1	120·1	127·8		

APPENDIX 3

TABLE 26 (*cont.*)

DIETARY SURVEY

Supplies of Nutrients compared with Estimated Requirements of Groups
(B.M.A. Standards)

(*b*) England: Vitamin C (mg. per day)

District	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Barrow—						
Estimated requirement	23·8	20·9	21·2	20·5	22·2	23·1
Supply	18·3	25·9	37·3	49·5	55·2	58·5
Supply as per cent. of requirement	76·9	123·9	175·9	241·5	248·6	253·2
Liverpool—						
Estimated requirement	21·1	21·5	18·6	21·8	21·8	23·2
Supply	39·4	35·0	41·0	64·4	57·4	87·4
Supply as per cent. of requirement	186·7	162·8	220·4	295·4	263·3	376·7
Yorkshire: West Riding—						
Estimated requirement	20·7	20·6	20·2	21·0	23·2	21·4
Supply	12·1	22·0	29·5	43·0	37·4	51·9
Supply as per cent. of requirement	58·5	106·8	146·0	204·8	161·2	242·5
Wisbech—						
Estimated requirement	21·4	21·1	20·7	21·1	21·0	21·3
Supply	26·2	30·3	45·6	49·6	64·9	53·1
Supply as per cent. of requirement	122·4	143·6	220·3	235·1	309·0	249·3
Fulham—						
Estimated requirement	17·1	20·8	20·8	20·7	21·3	22·3
Supply	74·9	63·7	73·8	79·1	96·9	108·3
Supply as per cent. of requirement	438·0	306·2	354·8	382·1	454·9	485·7
Bethnal Green—						
Estimated requirement	21·0	20·6	21·2	21·6	17·9	21·4
Supply	24·7	34·9	45·4	55·7	65·0	70·1
Supply as per cent. of requirement	117·6	169·4	214·2	257·9	363·1	327·6

TABLE 27

Intake as percentage of Recommended Allowances according to Rowett Research Institute (R.R.I.) and Committee of British Medical Association (B.M.A.) Standards

District and Nutrient	*Group I*		*Group II*		*Group III*		*Group IV*		*Group V*		*Group VI*	
	R.R.I.	*B.M.A.*	*R.R.I.*	*B.M.A.*	*R.R.I.*	*B.M.A.*	*R.R.I.*	*B.M.A.*	*R.R.I.*	*B.M.A.*	*R.R.I.*	*B.M.A.*
Scotland—												
Calories	78·7	76·6	96·0	94·1	100·2	101·7	109·6	111·8	116·3	117·3	129·3	131·0
Protein	66·7	62·9	81·4	80·8	96·9	88·2	108·2	98·3	115·8	104·2	128·1	120·1
Calcium	30·9	29·7	57·4	53·4	78·2	73·4	92·6	83·8	107·2	94·7	130·6	114·8
Vitamin A	19·8	21·7	33·0	34·9	45·8	46·1	69·3	66·6	75·4	70·0	90·7	83·1
Vitamin C	19·7	72·5	40·4	145·7	58·9	204·6	76·1	265·6	90·0	316·9	86·0	304·2
England—												
Calories	70·6	69·1	88·8	86·7	102·3	101·3	108·9	109·0	117·4	118·3	121·9	124·8
Protein	59·0	55·1	75·0	69·0	92·5	83·9	101·3	91·9	106·5	98·0	111·8	107·7
Calcium	25·3	23·8	35·5	33·0	52·2	47·4	67·1	70·6	84·2	88·6	107·4	93·5
Vitamin A	32·6	34·1	46·2	47·4	62·8	62·1	81·4	77·9	87·1	80·1	113·6	103·4
Vitamin C	37·3	131·5	46·0	165·1	58·0	210·1	73·5	261·1	93·2	328·2	112·4	376·3
All districts—												
Calories	72·2	70·6	91·2	89·2	101·4	101·4	109·2	110·3	116·8	117·8	125·3	127·7
Protein	60·4	56·7	77·4	73·0	94·3	85·7	104·3	94·7	111·2	101·1	119·3	113·4
Calcium	26·5	25·1	42·9	39·9	63·0	58·5	78·6	71·2	95·7	84·6	117·8	103·7
Vitamin A	30·0	31·7	41·8	43·3	55·8	55·5	76·1	73·0	81·2	75·1	102·6	93·7
Vitamin C	33·9	120·4	44·1	159·1	58·3	207·1	74·7	262·9	91·6	322·5	99·7	343·1

TABLE 28

CLINICAL SURVEY

Numbers of Children according to Sex, Expenditure Group and District

District	Boys							Girls							Total Subjects
	Expenditure Group						Total	Expenditure Group						Total	
	I	II	III	IV	V	VI		I	II	III	IV	V	VI		
Scotland—															
Aberdeen	—	11	5	4	5	2	27	—	8	3	3	3	3	20	47
Hopeman	—	11	24	2	—	—	37	—	8	11	8	—	—	27	64
Methlick	—	18	23	7	9	2	59	—	8	22	17	6	2	55	114
Tarves	—	64	50	7	5	9	135	—	63	50	15	5	9	142	277
Wemyss	—	12	52	37	14	8	123	—	19	52	29	12	8	120	243
Dundee	8	73	10	8	6	4	109	8	93	20	8	3	2	134	243
Total—Scotland	8	189	164	65	39	25	490	8	199	158	80	29	24	498	938
England—															
Barrow	9	36	37	11	—	2	95	7	49	55	19	11	13	154	249
Liverpool	18	84	18	5	4	3	132	13	113	17	6	1	6	156	288
Yorkshire	1	46	26	4	—	—	77	3	56	23	10	1	—	93	170
Wisbech	9	45	44	21	11	7	137	15	48	46	26	13	3	151	288
Fulham	2	38	15	7	7	4	73	1	38	9	7	6	5	66	139
Bethnal Green	52	167	66	23	—	—	308	37	195	68	27	3	1	331	639
Total—England	91	416	206	71	22	16	822	76	499	218	95	35	28	951	1,773
All districts	99	605	370	136	61	41	1,312	84	698	376	175	64	52	1,449	2,761

TABLE 29

CLINICAL SURVEY

Numbers of Children according to Age, Sex and District

District and Sex	*Age—years*													*Total*
	2	3	4	5	6	7	8	9	10	11	12	13	14	
Scotland—Boys														
Aberdeen	—	1	2	1	2	4	6	1	1	3	1	3	2	27
Hopeman	1	3	4	4	5	3	5	—	9	—	1	2	—	37
Methlick	1	3	2	4	10	4	6	5	4	7	4	4	5	59
Tarves	2	5	10	13	13	19	14	5	11	16	8	15	4	135
Wemyss	4	5	5	10	10	16	10	13	7	16	12	11	4	123
Dundee	8	5	9	10	9	17	7	9	6	8	7	8	6	109
Girls														
Aberdeen	—	1	—	2	3	2	6	1	—	2	—	—	3	20
Hopeman	3	4	2	3	3	—	3	—	1	5	2	1	—	27
Methlick	2	2	2	1	5	7	4	8	3	5	8	7	1	55
Tarves	7	4	15	13	16	11	13	9	15	14	9	12	4	142
Wemyss	4	4	8	4	12	11	14	17	13	14	11	8	—	120
Dundee	10	10	7	21	14	12	11	11	11	6	11	7	3	134
Total—Scotland :														
Boys	16	22	32	42	49	63	48	33	38	50	33	43	21	490
Girls	26	25	34	44	53	43	51	46	43	46	41	35	11	498
Subjects	42	47	66	86	102	106	99	79	81	96	74	78	32	988

England—Boys														
Barrow	3	7	8	9	8	9	7	12	11	7	8	5	1	95
Liverpool	12	11	2	14	12	10	8	20	9	11	8	9	6	132
Yorkshire	1	12	13	7	12	2	5	7	6	5	2	3	2	77
Wisbech	9	6	12	19	11	17	16	17	11	9	3	6	1	137
Fulham	9	7	3	7	8	5	6	2	4	12	3	4	3	73
Bethnal Green	10	23	24	31	36	27	35	28	31	25	16	18	4	308
Girls														
Barrow	4	10	5	8	13	16	15	9	15	10	14	19	16	154
Liverpool	9	16	12	16	13	14	14	7	13	14	12	9	7	156
Yorkshire	5	5	7	12	15	7	11	6	7	8	4	4	2	93
Wisbech	6	8	14	17	18	17	16	12	21	13	4	5	—	151
Fulham	5	6	3	7	6	4	6	7	3	5	4	6	4	66
Bethnal Green	20	31	42	37	26	22	33	11	29	24	23	24	9	331
Total England :														
Boys	44	66	62	87	87	70	77	86	72	69	40	45	17	822
Girls	49	76	83	97	91	80	95	52	88	74	61	67	38	951
Subjects	93	142	145	184	178	150	172	138	160	143	101	112	55	1,773
Total all districts :														
Boys	60	88	94	129	136	133	125	119	110	119	73	88	38	1,312
Girls	75	101	117	141	144	123	146	98	131	120	102	102	49	1,449
Subjects	135	189	211	270	280	256	271	217	241	239	175	190	87	2,761

TABLE 30

CLINICAL SURVEY

Body Measurements : Mean according to Sex and Age

Sex and Age Years	*Weight—lb.*		*Height—cm.*		*Cristal: Total ht. ratio*		*Biacromial breadth—cm.*	
	Mean	*S.E.*	*Mean*	*S.E.*	*Mean*	*S.E.*	*Mean*	*S.E.*
Boys—								
2	29·2	0·43	88·4	0·52	0·515	0·0024	20·33	0·178
3	33·0	0·41	95·1	0·48	0·536	0·0020	21·48	0·125
4	36·4	0·40	102·4	0·52	0·547	0·0022	22·86	0·146
5	39·3	0·42	106·9	0·45	0·556	0·0016	23·56	0·125
6	43·6	0·45	113·4	0·49	0·567	0·0014	25·22	0·114
7	48·3	0·51	118·8	0·48	0·571	0·0013	26·13	0·131
8	53·6	0·68	124·5	0·54	0·580	0·0013	27·22	0·138
9	58·2	0·70	128·8	0·60	0·585	0·0013	28·10	0·143
10	62·8	0·74	133·3	0·57	0·590	0·0014	28·88	0·141
11	69·3	0·73	138·3	0·57	0·595	0·0014	30·10	0·142
12	75·4	1·58	141·5	0·88	0·599	0·0016	30·77	0·241
13	83·2	1·64	146·8	0·91	0·602	0·0015	31·89	0·238
14	90·7	2·65	152·2	1·44	0·605	0·0027	33·04	0·367
Girls—								
2	27·4	0·37	86·9	0·48	0·519	0·0033	19·82	0·136
3	30·4	0·36	93·0	0·44	0·534	0·0024	20·93	0·161
4	34·3	0·32	100·0	0·37	0·550	0·0017	22·60	0·176
5	38·4	0·40	106·6	0·43	0·563	0·0015	23·62	0·112
6	42·0	0·47	112·0	0·46	0·571	0·0014	24·84	0·127
7	46·5	0·52	117·5	0·50	0·578	0·0015	25·88	0·130
8	51·2	0·54	123·0	0·47	0·581	0·0012	26·96	0·115
9	57·6	0·97	128·8	0·58	0·590	0·0016	27·97	0·141
10	62·0	0·69	132·3	0·52	0·596	0·0017	28·86	0·134
11	69·4	0·95	138·5	0·54	0·600	0·0015	29·61	0·145
12	77·4	1·50	143·3	0·74	0·604	0·0015	30·89	0·182
13	88·8	1·60	150·8	0·75	0·605	0·0014	32·46	0·201
14	99·9	2·26	155·7	1·14	0·603	0·0020	33·22	0·292

TABLE 31

CLINICAL SURVEY

Body Measurements : Both Sexes : Mean according to Expenditure Group and Age

Weight and Height

Age—years	*Group I*		*Group II*		*Group III*		*Group IV*		*Group V*		*Group VI*	
	Weight	*Height*	*Weight*	*Height*	*Weight*	*Height*	*Weight*	*Height*	*Weight*	*Height*	*Weight*	*Height*
2	29·3	88·3	28·3	87·6	27·5	87·1	28·5	88·3	27·2	87·7	—	—
3	30·4	93·2	30·9	92·7	32·2	94·9	33·1	96·3	35·6	100·3	38·0	102·8
4	35·7	100·9	34·6	100·2	35·9	101·8	35·7	102·4	40·2	110·8	40·2	108·3
5	39·2	106·5	38·1	105·7	39·4	107·6	39·2	108·4	42·1	110·8	44·1	112·6
6	42·8	112·5	41·8	111·2	43·1	113·5	45·0	115·2	47·0	119·0	45·5	117·3
7	46·2	116·6	45·8	116·6	47·6	118·6	48·5	119·6	54·5	124·2	52·8	123·5
8	50·9	123·4	51·3	122·9	52·1	123·7	53·8	124·2	55·5	126·9	62·9	130·8
9	55·4	127·3	56·4	127·4	58·6	129·1	60·1	130·2	60·9	131·4	64·5	135·7
10	62·8	132·7	61·1	131·9	62·3	132·9	64·4	133·9	64·8	136·4	67·4	134·1
11	63·8	135·3	67·8	137·2	70·1	138·6	71·7	140·5	74·9	142·6	75·4	143·5
12	72·3	138·8	73·1	141·0	76·6	143·3	76·7	142·5	87·6	148·0	96·8	149·4
13	81·0	146·7	82·9	146·8	85·5	148·5	85·9	150·8	90·8	151·1	107·5	158·5
14	86·8	150·2	90·5	150·8	96·3	153·6	97·6	156·1	110·7	163·5	105·8	160·5

Cristal : Total Height Ratio and Biacromial Breadth

Age—years	*Group I*		*Group II*		*Group III*		*Group IV*		*Group V*		*Group VI*	
	Ratio	*Breadth*	*Ratio*	*Breadth*	*Ratio*	*Breadth*	*Ratio*	*Breadth*	*Ratio*	*Breadth*	*Ratio*	*Breadth*
2	0·510	20·5	0·522	20·1	0·516	19·8	0·496	20·1	0·525	19·7	—	—
3	0·539	21·1	0·534	21·1	0·535	21·1	0·536	22·0	0·547	22·1	0·527	22·3
4	0·542	23·0	0·548	22·6	0·552	22·6	0·550	23·0	0·553	24·1	0·550	24·4
5	0·548	24·0	0·558	23·4	0·561	23·8	0·561	23·7	0·566	24·4	0·573	23·9
6	0·560	24·7	0·568	24·9	0·569	25·0	0·573	25·4	0·575	26·1	0·588	26·0
7	0·569	25·9	0·571	25·7	0·577	26·0	0·574	26·4	0·592	26·5	0·580	26·9
8	0·576	26·9	0·580	26·9	0·581	27·2	0·577	27·5	0·584	27·0	0·592	28·2
9	0·583	28·1	0·586	27·8	0·588	28·1	0·589	28·0	0·590	28·9	0·593	28·9
10	0·594	29·3	0·591	28·6	0·595	28·8	0·590	29·4	0·601	29·5	0·608	29·3
11	0·588	29·9	0·597	29·4	0·598	30·0	0·598	30·4	0·605	31·2	0·606	30·3
12	0·591	30·6	0·604	30·3	0·601	31·1	0·602	30·9	0·609	31·3	0·600	33·1
13	0·594	32·2	0·604	31·6	0·606	32·3	0·597	32·3	0·608	32·7	0·606	34·2
14	0·596	32·6	0·604	32·2	0·605	33·2	0·608	33·6	0·598	34·4	0·602	35·0

TABLE 32

CLINICAL SURVEY

Body Measurements : Weighted mean according to Expenditure Group with Grouping of Ages

Measurement and Age (years)	*Group I*	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Weight—						
2– 5	36·3	35·6	36·9	37·0	40·1	41·8
6– 9	49·2	49·2	50·7	52·2	55·0	57·3
10–15	71·6	73·2	75·9	77·0	82·5	88·2
All ages	57·6	58·2	60·2	61·3	65·4	69·2
Height—						
2– 5	102·1	101·3	103·3	104·2	108·3	109·3
6– 9	120·4	120·0	121·7	122·7	125·7	127·5
10–15	139·6	140·4	142·0	143·4	146·4	147·7
All ages	126·4	126·5	128·2	129·4	132·5	134·0
Cristal Height : Total height ratio—						
2– 5	0·545	0·550	0·553	0·553	0·559	0·557
6– 9	0·573	0·577	0·579	0·578	0·586	0·588
10–15	0·592	0·599	0·601	0·598	0·605	0·605
All ages	0·577	0·583	0·585	0·583	0·590	0·591
Biacromial breadth—						
2– 5	23·1	22·7	22·9	23·1	23·8	23·6
6– 9	26·5	26·4	26·7	26·9	27·1	27·6
10–15	30·7	30·2	30·8	31·0	31·5	32·0
All ages	27·9	27·6	28·0	28·2	28·6	29·0

APPENDIX 3

TABLE 33

CLINICAL SURVEY

Cristal Height : Calculated Mean Value

Age—years	*Boys*				*Girls*			
	Mean total height	*Mean ratio*	*Calculated Mean cristal height*	*Difference*	*Mean total height*	*Mean ratio*	*Calculated mean cristal height*	*Difference*
	A		*B*	*A-B*	*A*		*B*	*A-B*
2	88·4	0·515	45·5	42·9	86·9	0·519	45·1	41·8
3	95·1	0·536	51·0	44·1	93·0	0·534	49·7	43·3
4	102·4	0·547	56·0	46·4	100·0	0·550	55·0	45·0
5	106·9	0·556	59·4	47·5	106·6	0·563	60·0	46·6
6	113·4	0·567	64·3	49·1	112·0	0·571	64·0	48·0
7	118·8	0·571	67·8	51·0	117·5	0·578	67·9	49·6
8	124·5	0·580	72·2	52·3	123·0	0·581	71·5	51·5
9	128·8	0·585	75·3	53·5	128·8	0·590	76·0	52·8
10	133·3	0·590	78·6	54·7	132·3	0·596	78·9	53·4
11	138·3	0·595	82·3	56·0	138·5	0·600	83·1	55·4
12	141·5	0·599	84·8	56·7	143·3	0·604	86·6	56·7
13	146·8	0·602	88·4	58·4	150·8	0·605	91·2	59·6
14	152·2	0·605	92·1	60·1	155·7	0·603	93·9	61·8

TABLE 34

CLINICAL SURVEY

Haemoglobin : Mean percentage according to Sex, Expenditure Group and Age

Age—years	*Boys*								*Girls*							
	Groups I and II		*Group III*		*Group IV*		*Groups V and VI*		*Groups I and II*		*Group III*		*Group IV*		*Groups V and VI*	
	No.	*Mean*	*No.*	*Mean*	*No.*	*Mean*	*No.*	*Mean*	*No.*	*Mean*	*No.*	*Mean*	*No.*	*Mean*	*No.*	*Mean*
Under 1	44	77	17	80	5	78	2	90	53	77	17	73	6	86	2	85
1	53	81	37	77	7	76	5	86	45	77	15	79	11	86	12	83
2	43	82	18	81	4	77	2	90	56	87	18	84	4	89	3	80
3	46	85	26	81	7	79	6	96	60	86	25	84	7	90	2	78
4	61	87	21	83	4	93	3	92	65	88	29	90	8	87	—	—
5	73	87	32	86	10	87	5	93	77	90	29	89	11	89	7	87
6	70	89	36	90	9	91	8	91	78	90	28	91	19	89	7	91
7	61	92	44	89	12	92	12	90	54	91	31	94	14	90	9	91
8	65	91	31	90	13	89	10	93	81	93	30	92	10	95	12	96
9	57	92	40	95	14	90	10	93	70	96	27	93	17	90	8	98
10	53	92	33	92	15	95	6	93	66	96	26	97	12	95	14	95
11	66	94	20	96	14	99	14	96	55	96	36	97	18	95	6	92
12	31	93	22	95	12	96	8	95	49	96	27	97	10	100	10	102
13	44	96	19	96	8	99	11	95	35	99	26	100	15	99	16	100
14	19	91	11	97	8	98	2	97	17	95	12	94	3	106	16	98

TABLE 35

CLINICAL SURVEY

Haemoglobin : Mean percentage according to Sex and Age

Age—years	*Boys*			*Girls*			*All children*		
	Number	*Hb*		*Number*	*Hb*		*Number*	*Hb*	
		%	*g.**		%	*g.**		%	*g.**
0– 1	68	78	11·5	78	77	11·4	146	78	11·5
1– 2	102	79	11·7	83	79	11·7	185	79	11·7
2– 3	67	82	12·1	81	86	12·7	148	84	12·4
3– 4	85	84	12·4	94	86	12·7	179	85	12·6
4– 5	89	86	12·7	102	88	13·0	191	88	13·0
5– 6	120	87	12·9	124	90	13·3	244	88	13·0
6– 7	123	90	13·3	132	90	13·3	255	90	13·3
7– 8	129	91	13·5	108	92	13·6	237	91	13·5
8– 9	119	91	13·5	133	93	13·8	252	92	13·6
9–10	121	93	13·8	122	95	14·1	243	94	13·9
10–11	107	92	13·6	118	96	14·2	225	94	13·9
11–12	114	95	14·1	115	96	14·2	229	96	14·2
12–13	73	94	13·9	96	97	14·4	169	96	14·2
13–14	82	96	14·2	92	99	14·7	174	98	14·5
14–15	40	94	13·9	48	96	14·2	88	95	14·1

* 100 per cent. = 14·8 g. Hb.

TABLE 36

CLINICAL SURVEY

Clinical abnormalities : incidence according to Sex

Clinical abnormality	*Boys*			*Girls*		
	Cases	*Subjects examined*	*Percentage incidence*	*Cases*	*Subjects examined*	*Percentage incidence*
Chronic upper respiratory catarrh	250	1,659	15·1	188	1,808	10·4
Knock-knee 1-4 cm.	549	1,652	33·2	614	1,806	34·0
Flat foot	114	1,131	8·6	125	1,448	8·6
Skeletal deformities :						
Frontal bossing	159	1,659	9·6	115	1,808	6·4
Harrison's sulcus	135	1,659	8·1	97	1,808	5·4
Pigeon chest	67	1,659	4·0	51	1,808	2·8
Pyogenic infections	136	1,660	8·2	98	1,808	5·5
Skin signs :						
Dry skin	325	1,660	19·6	324	1,808	17·9
Follicular eruption	426	1,660	25·7	369	1,808	20·4
Blepharitis	45	1,659	2·7	52	1,807	2·9
Otitis media	81	1,650	4·9	75	1,778	4·2
Mouth signs :						
Gingivitis	71	1,658	4·3	46	1,792	2·6
Angular stomatitis	28	1,658	1·7	29	1,792	1·6
Bronchitis	188	1,674	11·3	151	1,828	8·3

TABLE 37—CLINICAL SURVEY

Clinical abnormalities : Incidence according to Age and Sex

Age and Sex		Chronic Upper Respiratory Catarrh			Knock Knee						Flat Foot			Skeletal Deformities								
					1-4 cm.			>4 cm.						Frontal Bossing			Harrison's Sulcus			Pigeon Chest		
		Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%
Boys	under 5 years	98	543	18·0	180	541	33·3	3	541	0·6	77	250	30·8	47	544	8·6	61	542	11·3	10	542	1·8
	5-10 years	118	643	18·4	242	641	37·8	3	641	0·5	17	619	2·8	75	643	11·7	44	643	6·8	36	643	5·6
	10-15 years	33	429	7·7	115	427	26·9	6	427	0·1	17	419	4·1	34	429	7·9	25	429	5·8	16	429	3·7
	over 15 years	1	44	2·3	12	43	27·9	4	43	9·3	3	43	7·0	3	44	6·8	5	44	11·4	5	44	11·4
Girls	under 5 years	91	606	15·0	215	604	35·6	5	604	0·8	74	292	25·3	58	606	9·6	33	606	5·4	9	606	1·5
	5 to 10 years	65	681	9·5	271	681	39·8	5	681	0·7	36	650	5·5	46	681	6·8	37	681	5·4	28	681	4·1
	10-15 years	32	504	6·3	121	504	24·0	11	504	2·2	15	489	3·1	11	504	2·2	27	504	5·4	13	504	2·6
	over 15 years	0	17	0	7	17	41·2	0	17	0	0	17	0	0	17	0	0	17	0	1	17	5·9

Age and Sex		Pyogenic Infections			Skin Signs						Eye Infections						Otitis Media			Mouth Signs					
					Dry Skin			Follicular Eruption			Blepharitis			Styes						Gingivitis			Angular Stomatitis		
		Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%
Boys	under 5 years	41	544	7·5	72	544	13·2	64	544	11·8	17	543	3·1	2	543	0·4	23	534	4·3	3	542	0·6	8	542	1·5
	5-10 years	60	643	9·3	169	643	26·3	196	643	30·5	16	643	2·5	3	643	0·5	35	643	5·4	11	643	1·7	7	643	1·1
	10-15 years	29	429	6·8	78	429	18·2	155	429	36·1	11	429	2·6	3	429	0·7	19	429	4·4	48	429	11·2	12	429	2·8
	over 15 years	6	44	13·6	6	44	13·6	11	44	25·0	1	44	2·3	0	44	0	4	44	9·1	9	44	20·5	1	44	2·3
Girls	under 5 years	45	606	7·4	83	606	13·7	44	606	7·3	14	605	2·3	7	605	1·7	26	585	4·4	1	598	0·2	7	594	1·2
	5-10 years	40	681	5·9	171	681	25·1	168	681	24·7	28	681	4·1	5	681	0·7	24	674	3·6	14	681	2·1	16	681	2·3
	10-15 years	12	504	2·4	68	504	13·5	154	504	30·6	9	504	1·8	3	504	0·6	23	502	4·6	30	504	6·0	6	504	1·2
	over 15 years	1	17	5·9	2	17	11·8	3	17	17·6	1	17	5·9	0	17	0	2	17	11·8	1	17	5·9	0	17	0

TABLE 38

CLINICAL SURVEY

Clinical abnormalities : Incidence according to Expenditure Group and Sex

Expenditure Group and Sex		Chronic Upper-Respiratory Catarrh			Knock Knee					
					1-4 cm.			>4 cm.		
		Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%
Boys	Groups I and II	160	913	17·4	308	906	34·0	7	906	0·8
	Group III	64	469	13·6	158	469	33·7	8	469	1·7
	Group IV	11	160	6·9	46	160	28·8	0	160	0
	Groups V and VI	15	117	12·8	37	117	31·6	1	117	0·9
Girls	Groups I and II	128	1,012	12·6	355	1,009	35·2	8	1,009	0·8
	Group III	44	450	9·8	160	450	35·6	12	450	2·7
	Group IV	9	208	4·3	65	209	31·1	0	209	0
	Groups V and VI	7	138	5·1	34	138	24·6	1	138	0·7

continued below

Flat Foot			Skeletal Deformities								
			Frontal Bossing			Harrison's Sulcus			Pigeon Chest		
Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%	Cases	Subjects	%
64	719	8·9	100	914	10·9	86	913	9·3	36	913	3·9
26	370	7·0	42	469	9·0	33	468	7·1	17	468	3·6
13	136	9·6	10	160	6·3	12	160	7·5	6	160	3·8
11	106	9·4	7	117	6·0	4	117	3·4	8	117	6·8
80	803	10·0	75	1,012	7·4	63	1,012	6·2	29	1,012	2·9
22	362	6·1	26	450	5·8	17	450	3·8	12	450	2·7
15	167	9·0	6	208	2·9	13	208	6·2	6	208	2·9
8	116	6·9	8	138	5·8	4	138	2·9	4	138	2·9

TABLE 38 (*cont.*)

CLINICAL SURVEY

Clinical abnormalities: Incidence according to Expenditure Group and Sex

Expenditure Group and Sex		*Pyogenic Infections*			*Skin Signs*					
					Dry Skin			*Follicular Eruption*		
		Cases	*Subjects*	%	*Cases*	*Subjects*	%	*Cases*	*Subjects*	%
Boys	Groups I and II	93	914	10·2	193	914	21·1	226	914	24·7
	Group III	36	469	7·7	86	469	18·3	123	469	26·2
	Group IV	7	160	4·4	27	160	16·9	49	160	30·6
	Groups V and VI	0	117	0	19	117	16·2	28	117	23·9
Girls	Groups I and II	66	1,012	6·5	194	1,012	19·2	197	1,012	19·5
	Group III	20	450	4·4	85	450	18·9	99	450	22·0
	Group IV	10	208	4·8	31	208	14·9	41	208	19·7
	Groups V and VI	3	138	2·2	14	138	10·1	32	138	23·2

continued below

Eye Infections						*Otitis Media*			*Mouth Signs*					
Blepharitis			*Styes*						*Gingivitis*			*Angular Stomatitis*		
Cases	*Subjects*	%	*Cases*	*Subjects*	%	*Cases*	*Subjects*	%	*Cases*	*Subjects*	%	*Cases*	*Subjects*	%
31	913	3·4	5	913	0·5	51	907	5·6	47	912	5·2	13	912	1·4
9	469	1·9	2	469	0·4	19	467	4·1	20	469	4·3	10	469	2·1
2	160	1·3	1	160	0·6	10	160	6·3	1	160	0·6	4	160	2·5
3	117	2·6	0	117	0	1	116	0·9	3	117	2·6	1	117	0·9
37	1,011	3·7	9	1,011	0·9	43	996	4·3	27	1,006	2·7	20	1,000	2·0
9	450	2·0	2	450	0·4	18	441	4·1	10	449	2·2	5	450	1·1
3	208	1·4	0	208	0	9	205	4·4	7	207	3·3	3	208	1·4
3	138	2·2	4	138	2·9	5	136	3·7	2	138	1·4	1	138	0·7

TABLE 39

CLINICAL SURVEY

Bronchitis : Incidence according to Sex, Age and Expenditure Group

Expenditure Group	*Boys*			*Girls*		
	under 5 years	*5–10 years*	*over 10 years*	*under 5 years*	*5–10 years*	*over 10 years*
I and II—						
Cases	68	37	12	66	33	10
Subjects examined	331	350	241	387	391	243
Percentage incidence	20·5	10·6	5·0	17·1	8·4	4·1
III—						
Cases	24	22	5	16	11	4
Subjects examined	156	193	125	144	164	144
Percentage incidence	15·4	11·4	4·0	11·1	6·7	2·8
IV—						
Cases	4	9	2	4	3	1
Subjects examined	39	60	62	56	89	72
Percentage incidence	10·3	15·0	3·2	7·1	3·4	1·4
V and VI—						
Cases	1	3	1	0	2	1
Subjects examined	23	47	47	26	46	66
Percentage incidence	4·3	6·4	2·1	0	4·3	1·5
All groups—						
Cases	97	71	20	86	49	16
Subjects examined	549	650	475	613	690	525
Percentage incidence	17·7	10·9	4·2	14·0	7·1	3·0

APPENDIX 3

TABLE 40

CLINICAL SURVEY

Teeth : Mean numbers present according to Expenditure Group and Age and mean numbers decayed or filled

Age—years	*Expenditure Group*	*No. of Children*	*Deciduous*			*Permanent*					*Total*	*Decayed*		*Filled*
			A B	C	D E	1 2	3	4 5	6	7		*Decid.*	*Perm.*	
0– 1	<4s.	148	1·8	—	—	—	—	—	—	—	1·8	—	—	—
	4–6s.	58	1·8	0·1	0·1	—	—	—	—	—	1·9	—	—	—
	6–8s.	17	1·6	—	—	—	—	—	—	—	1·6	—	—	—
	>8s.	6	3·4	—	—	—	—	—	—	—	3·4	—	—	—
1– 2	<4s.	138	7·7	1·8	3·6	—	—	—	—	—	13·1	0·3	—	—
	4–6s.	60	7·7	1·8	3·5	—	—	—	—	—	12·9	—	—	—
	6–8s.	24	7·7	2·2	3·2	—	—	—	—	—	13·2	—	—	—
	>8s.	19	7·3	2·3	3·6	—	—	—	—	—	13·2	0·1	—	—
2– 3	<4s.	126	7·9	4·0	7·5	—	—	—	—	—	19·5	2·3	—	—
	4–6s.	47	8·0	3·9	7·4	—	—	—	—	—	19·3	1·1	0·1	—
	6–8s.	12	7·8	4·0	6·9	—	—	—	—	—	18·6	1·2	—	—
	>8s.	7	8·0	4·0	8·0	—	—	—	—	—	20·0	0·3	—	—
3– 4	<4s.	126	7·9	4·0	7·9	—	—	—	—	—	19·8	4·0	—	0·1
	4–6s.	65	7·8	4·0	7·8	—	—	—	—	—	19·6	4·0	—	—
	6–8s.	20	7·8	4·0	7·9	—	—	—	—	—	19·7	3·7	—	0·2
	>8s.	6	8·0	4·0	8·0	—	—	—	—	—	20·0	1·3	—	—
4– 5	<4s.	130	7·9	4·0	7·4	—	—	—	—	—	19·3	5·1	—	—
	4–6s.	61	7·9	4·0	7·6	—	—	—	—	—	19·6	5·8	—	—
	6–8s.	16	7·7	3·9	7·2	—	—	—	0·1	—	18·8	4·6	—	—
	>8s.	6	7·8	4·0	8·0	—	—	—	—	—	19·8	5·2	—	0·3
5– 6	<4s.	164	7·1	4·0	6·3	0·4	—	—	1·0	—	18·9	5·7	0·1	0·1
	4–6s.	55	7·4	4·0	6·8	0·4	—	—	0·6	—	19·2	6·1	0·1	—
	6–8s.	23	7·1	3·9	7·0	0·6	—	—	0·5	—	19·2	6·7	—	0·1
	>8s.	12	7·5	4·0	7·5	0·3	—	—	0·8	—	20·1	7·2	—	0·3
6– 7	<4s.	151	5·4	3·9	5·9	1·9	—	—	2·9	—	20·1	6·1	2·1	0·1
	4–6s.	65	5·5	3·9	6·3	1·8	—	—	2·9	—	20·4	6·1	0·5	—
	6–8s.	34	4·5	3·9	5·4	2·8	—	—	3·3	—	20·0	6·8	0·4	0·1
	>8s.	9	4·2	3·7	5·6	3·2	—	0·1	3·8	—	20·6	7·5	1·5	—
7– 8	<4s.	115	2·7	3·8	5·0	4·4	0·2	0·3	3·8		20·3	4·7	0·9	0·2
	4–6s.	69	2·2	3·7	4·9	5·0	—	0·2	3·8	—	19·7	4·6	0·9	0·4
	6–8s.	23	1·8	3·9	5·3	5·3	—	0·2	3·6	—	20·1	5·4	1·2	0·3
	>8s.	14	1·6	3·6	3·8	5·6	—	0·7	4·0	—	19·3	4·5	0·8	0·3
8– 9	<4s.	136	0·8	3·6	4·0	6·8	0·2	0·7	3·8	—	19·8	3·5	1·3	0·3
	4–6s.	60	0·5	3·3	4·1	6·8	0·4	1·0	3·8	—	19·8	3·5	1·4	0·4
	6–8s.	27	0·3	3·3	3·6	7·3	0·4	1·0	3·8	—	19·7	3·3	1·6	0·5
	>8s.	18	0·3	3·2	4·2	7·4	0·6	0·8	3·8	—	20·3	3·9	1·7	0·5
9–10	<4s.	138	0·1	2·8	3·3	7·8	0·9	2·0	3·8	0·1	20·8	3·0	1·4	0·5
	4–6s.	67	0·2	2·7	2·8	7·6	1·0	2·5	3·7	0·2	20·6	3·0	1·7	0·5
	6–8s.	35	0·4	2·5	3·6	7·6	1·2	2·1	3·8	0·1	21·2	3·4	1·5	0·2
	>8s.	19	0·3	3·3	3·8	7·5	0·6	1·0	3·8	—	20·4	3·3	1·6	0·7
10–11	<4s.	114	0·1	1·6	2·0	7·9	2·1	3·8	3·7	0·6	21·8	1·6	1·4	0·6
	4–6s.	59	—	1·8	1·9	8·0	2·0	3·7	3·5	0·6	21·5	1·9	1·6	0·5
	6–8s.	29	0·1	1·2	1·6	7·9	2·2	3·8	3·6	0·5	21·0	1·5	1·6	0·5
	>8s.	21	—	1·1	1·5	8·0	2·2	3·6	3·6	0·5	20·5	1·4	1·4	1·2

continued on p. 152

TABLE 40 (*cont.*)

CLINICAL SURVEY

Teeth : Mean Numbers present according to Expenditure Group and Age and mean numbers decayed or filled

Age—years	*Expenditure Group*	*No. of Children*	*Deciduous*			*Permanent*					*Total*	*Decayed*		*Filled*
			A B	C	D E	1 2	3	4 5	6	7		*Decid.*	*Perm.*	
11–12	<4s.	109	0·1	0·8	0·9	7·9	2·9	5·2	3·6	1·9	23·3	0·6	1·7	0·8
	4–6s.	52	—	0·7	0·8	7·9	3·2	6·0	3·4	1·6	23·6	0·9	1·7	0·6
	6–8s.	30	—	0·5	0·5	7·9	3·3	5·9	3·6	1·6	23·4	0·7	2·7	0·6
	>8s.	17	—	0·7	0·8	8·0	2·8	6·0	3·6	1·9	23·9	0·4	1·6	1·1
12–13	<4s.	76	—	0·3	0·4	8·0	3·5	6·5	3·6	2·7	24·9	0·4	2·4	0·6
	4–6s.	49	—	0·3	0·7	7·9	3·5	6·3	3·6	2·6	24·9	0·8	2·4	0·6
	6–8s.	26	—	0·2	0·3	7·9	3·7	6·9	3·5	2·5	25·0	0·6	2·8	0·4
	>8s.	17	—	0·5	0·2	7·8	3·5	6·9	3·2	2·6	24·7	2·2	3·1	0·7
13–14	<4s.	73	—	0·1	0·3	8·0	3·9	7·1	3·7	3·1	26·1	0·2	2·4	0·9
	4–6s.	45	—	—	0·1	8·0	3·9	7·3	3·6	2·9	25·8	0·1	3·6	0·6
	6–8s.	24	—	0·1	0·3	8·0	3·9	7·0	3·8	3·4	26·5	0·3	2·8	0·9
	>8s.	26	—	—	—	8·0	3·9	7·5	3·7	3·1	26·3	—	2·6	2·1
14–15	<4s.	32	—	—	0·1	8·0	4·0	7·6	3·4	3·5	26·4	0·1	3·0	0·8
	4–6s.	14	—	—	—	8·0	3·9	7·7	3·6	3·7	26·9	—	2·6	1·2
	6–8s.	5	—	—	—	7·6	4·0	7·6	4·0	3·6	26·8	—	2·6	3·0
	>8s.	15	—	0·1	0·1	8·0	3·9	7·6	3·7	3·8	27·1	0·2	1·7	4·6

Note.—Letters indicate deciduous teeth : A B incisors ; C canines ; D E molars.

Numbers indicate permanent teeth : 1 2 incisors ; 3 canines ; 4 5 pre-molars ; 6 7 molars.

APPENDIX 3

TABLE 41

FEEDING EXPERIMENT

Numbers of Children according to Expenditure Group, Sex and Age

Sex and age (years)	*Group I*		*Group II*		*Group III*		*Group IV*		*Group V*		*Group VI*		*All Groups*	
	Fed	*Control*	*Fed*	*Control*	*Fed*	*Control*	*Fed*	*Control*	*Fed*	*Control*	*Fed*	*Control*	*Fed*	*Control*
Boys—														
2	2	1	4	1	2	1	—	—	—	—	—	—	8	3
3	—	—	4	8	5	1	—	—	—	—	—	—	9	9
4	2	3	10	10	6	1	—	—	—	—	—	—	18	14
5	6	1	15	16	10	6	3	3	1	2	—	—	35	28
6	2	1	13	13	12	7	3	2	—	—	3	1	33	24
7	4	1	16	12	13	9	2	2	3	1	3	1	41	26
8	4	2	14	18	12	5	2	6	—	—	—	—	32	31
9	1	2	11	11	10	8	4	6	1	4	1	2	28	33
10	2	3	12	7	10	9	2	4	—	—	—	—	26	23
11	3	2	15	9	1	5	1	7	1	1	—	—	21	24
12	2	1	6	7	3	8	—	—	—	—	—	—	11	16
13	2	1	6	1	2	2	—	—	—	—	—	—	10	4
Total	30	18	126	113	86	62	17	30	6	8	7	4	272	235
Girls—														
2	1	1	8	2	—	—	1	2	—	—	—	—	10	5
3	2	1	4	7	3	1	—	—	—	—	—	—	9	9
4	2	1	11	10	11	6	3	1	—	—	—	—	27	18
5	—	—	13	15	9	4	4	1	3	1	—	—	29	21
6	4	2	12	16	9	6	3	2	2	1	—	—	30	27
7	1	3	7	9	9	10	8	2	1	2	—	—	26	26
8	3	5	14	15	8	8	—	—	—	—	2	1	27	29
9	6	2	14	17	9	8	6	5	2	3	2	1	39	36
10	4	1	14	16	10	5	2	3	1	1	3	2	34	28
11	1	1	9	6	11	4	4	8	—	—	2	1	27	20
12	2	1	10	9	5	5	—	—	—	—	—	—	17	15
13	—	—	—	—	4	3	1	2	—	—	—	—	5	5
Total	26	18	116	122	88	60	32	26	9	8	9	5	280	239

TABLE 42

FEEDING EXPERIMENT

Numbers of Children according to Sex, Expenditure Group and District

Group and District	*Boys*							*Girls*							*Total Subjects*
	Expenditure Group						*Total*	*Expenditure Group*						*Total*	
	I	*II*	*III*	*IV*	*V*	*VI*		*I*	*II*	*III*	*IV*	*V*	*VI*		
Fed—															
Tarves	—	29	37	1	3	5	75	—	30	28	9	2	7	76	151
Wisbech	—	19	17	7	1	—	44	3	17	18	9	5	—	52	96
Wemyss	—	3	15	7	2	2	29	—	2	19	9	2	2	34	63
Dundee	7	31	1	—	—	—	39	5	22	4	—	—	—	31	70
Bethnal Green	23	44	16	2	—	—	85	18	45	19	5	—	—	87	172
Total	30	126	86	17	6	7	272	26	116	88	32	9	9	280	552
Control—															
Tarves	—	18	19	2	5	1	45	—	9	21	7	3	1	41	86
Wisbech	4	19	11	6	1	—	41	7	15	11	4	1	—	38	79
Wemyss	—	4	10	11	2	1	28	—	10	11	9	4	4	38	66
Dundee	1	23	—	3	—	—	27	3	32	1	—	—	—	36	63
Bethnal Green	13	49	22	8	—	2	94	8	56	17	5	—	—	86	180
Total	18	113	62	30	8	4	235	18	122	61	25	8	5	239	474

TABLE 43

FEEDING EXPERIMENT

Weight and Height : Mean Initial Values and Gains according to Age

Age	*Fed*				*Control*			
	Weight—lb.		*Height—cm.*		*Weight—lb.*		*Height—cm.*	
	Initial	*Gain*	*Initial*	*Gain*	*Initial*	*Gain*	*Initial*	*Gain*
2	29·30	4·82	87·29	8·92	27·80	3·73	86·68	7·59
3	30·55	3·92	92·92	7·26	30·90	5·40	93·37	6·81
4	36·41	4·86	101·82	7·00	34·83	3·98	100·67	6·00
5	38·94	4·99	107·03	6·47	38·27	4·24	107·04	5·79
6	43·28	5·85	112·51	6·15	43·92	4·85	114·03	5·67
7	48·01	6·07	118·89	5·79	48·44	5·36	118·59	5·47
8	53·12	6·92	123·70	5·59	52·29	5·62	126·02	5·30
9	59·03	8·60	128·79	5·55	58·41	6·69	129·01	5·01
10	62·40	8·50	132·46	5·56	61·51	7·41	132·94	5·13
11	70·27	11·23	139·34	5·98	71·00	9·23	139·93	5·44
12	73·42	12·06	141·15	5·93	76·31	11·54	142·56	5·70
13	84·15	13·15	149·33	5·61	84·79	9·41	148·37	4·77

APPENDIX 3

TABLE 44

FEEDING EXPERIMENT

Weight and Height : Mean Initial Values and Gains according to Expenditure Group

Expenditure Group	*Fed*				*Control*			
	Weight—lb.		*Height—cm.*		*Weight—lb.*		*Height—cm.*	
	Initial	*Gain*	*Initial*	*Gain*	*Initial*	*Gain*	*Initial*	*Gain*
I	52·15	7·60	120·12	5·88	51·11	5·44	119·98	5·20
II	50·86	7·09	118·94	6·05	48·52	5·79	118·03	5·61
III	52·45	7·36	121·28	6·18	57·02	6·79	125·82	5·40
IV	52·90	7·81	122·34	6·36	59·89	7·68	129·07	5·54
V	51·73	7·85	121·20	6·23	56·71	7·64	126·86	5·71
VI	59·62	7·37	128·71	6·04	63·54	8·76	131·79	5·63

TABLE 45

FEEDING EXPERIMENT

Bronchitis : Number of Cases at beginning and end of experiment according to Age, Expenditure Group and Sex

Age—years *Expenditure Group* *Sex*	*Control*				*Experimental*			
	at Beginning		*at End*		*at Beginning*		*at End*	
	Number	*%*	*Number*	*%*	*Number*	*%*	*Number*	*%*
Under 5	18/120	15·0	16/120	13·3	29/145	20·0	17/145	11·7
5–10 years	22/283	7·8	7/283	2·5	31/321	9·7	15/321	4·7
10–15 years	8/167	4·8	1/167	0·6	6/160	3·8	1/160	0·6
Groups I and II	34/305	11·1	22/305	7·2	43/353	12·2	24/353	6·8
Group III	9/141	6·4	2/141	1·4	18/172	10·5	4/172	2·3
Group IV	3/80	3·8	0/80	0·0	4/58	6·9	5/58	8·6
Groups V and VI	2/44	4·5	0/44	0·0	1/43	2·3	0/43	0·0
Boys	24/270	8·9	9/270	3·3	37/301	12·3	19/301	6·3
Girls	24/300	8·0	15/300	5·0	29/325	8·9	14/325	4·3

APPENDIX 4

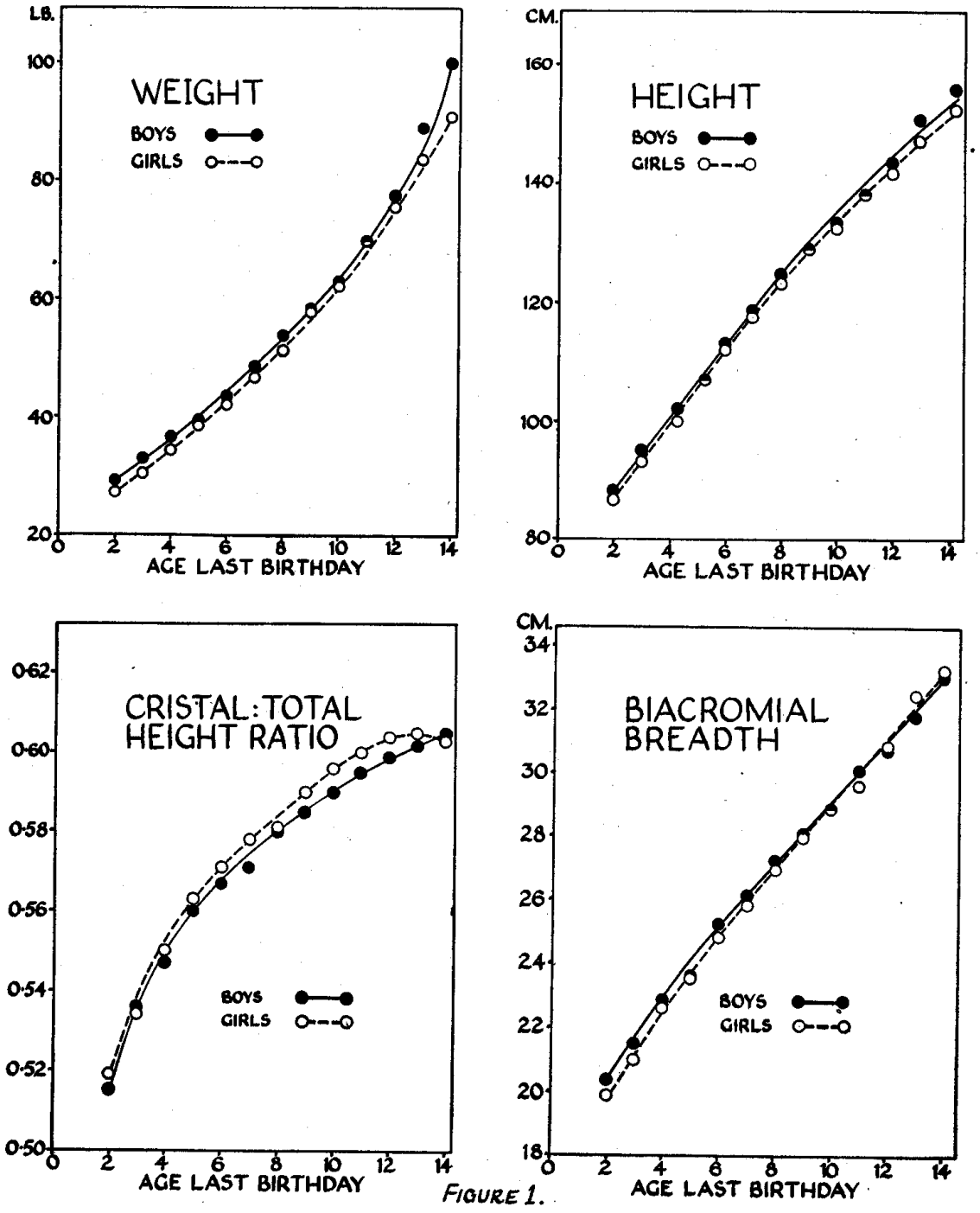
Index to Figures

FIG. *Clinical Survey*

1. Weight, height, cristal : total height ratio and biacromial breadth according to age and sex.
2. Weight : height ratio ; Survey and London County Council data compared.
3. Height according to age and expenditure group.
4. Weight according to age and expenditure group.
5. Cristal : total height ratio and biacromial breadth according to expenditure group with grouping of ages.
6. Haemoglobin according to age and sex.
7. Haemoglobin according to age and sex ; Survey and London County Council data compared.

Feeding Experiment

8. Weight gain according to age and expenditure group.
9. Height gain according to age and expenditure group.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40
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WEIGHT
BOYS
GIRLS
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AGE LAST BIRTHDAY
CM.
160
140
120
100
80
HEIGHT
BOYS
GIRLS
0 2 4 6 8 10 12 14
AGE LAST BIRTHDAY
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0·60
0·58
0·56
0·54
0·52
0·50
CRISTAL:TOTAL
HEIGHT RATIO
BOYS
GIRLS
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AGE LAST BIRTHDAY
CM.
34
32
30
28
26
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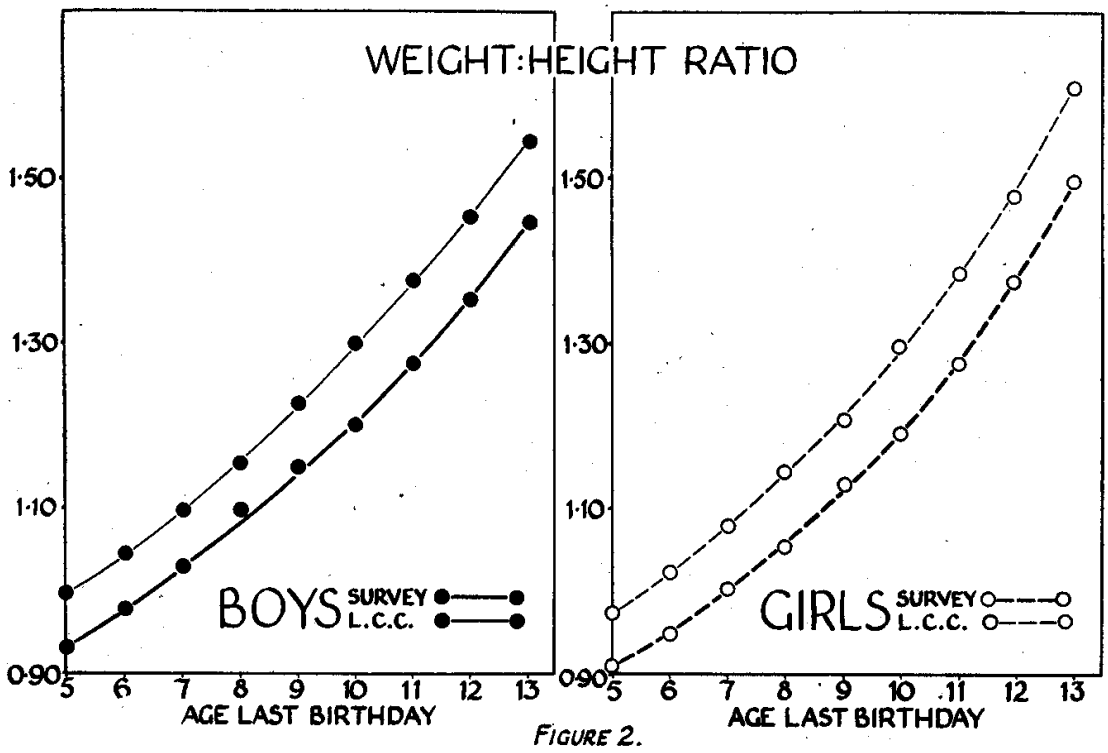
18
BIACROMIAL
BREADTH
BOYS
GIRLS
0 2 4 6 8 10 12 14
AGE LAST BIRTHDAY

FIGURE 1.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1·30
1·10
0·90
5 6 7 8 9 10 11 12 13
AGE LAST BIRTHDAY
BOYS
SURVEY
L.C.C.
GIRLS
SURVEY
L.C.C.

FIGURE 2.

APPENDIX 4

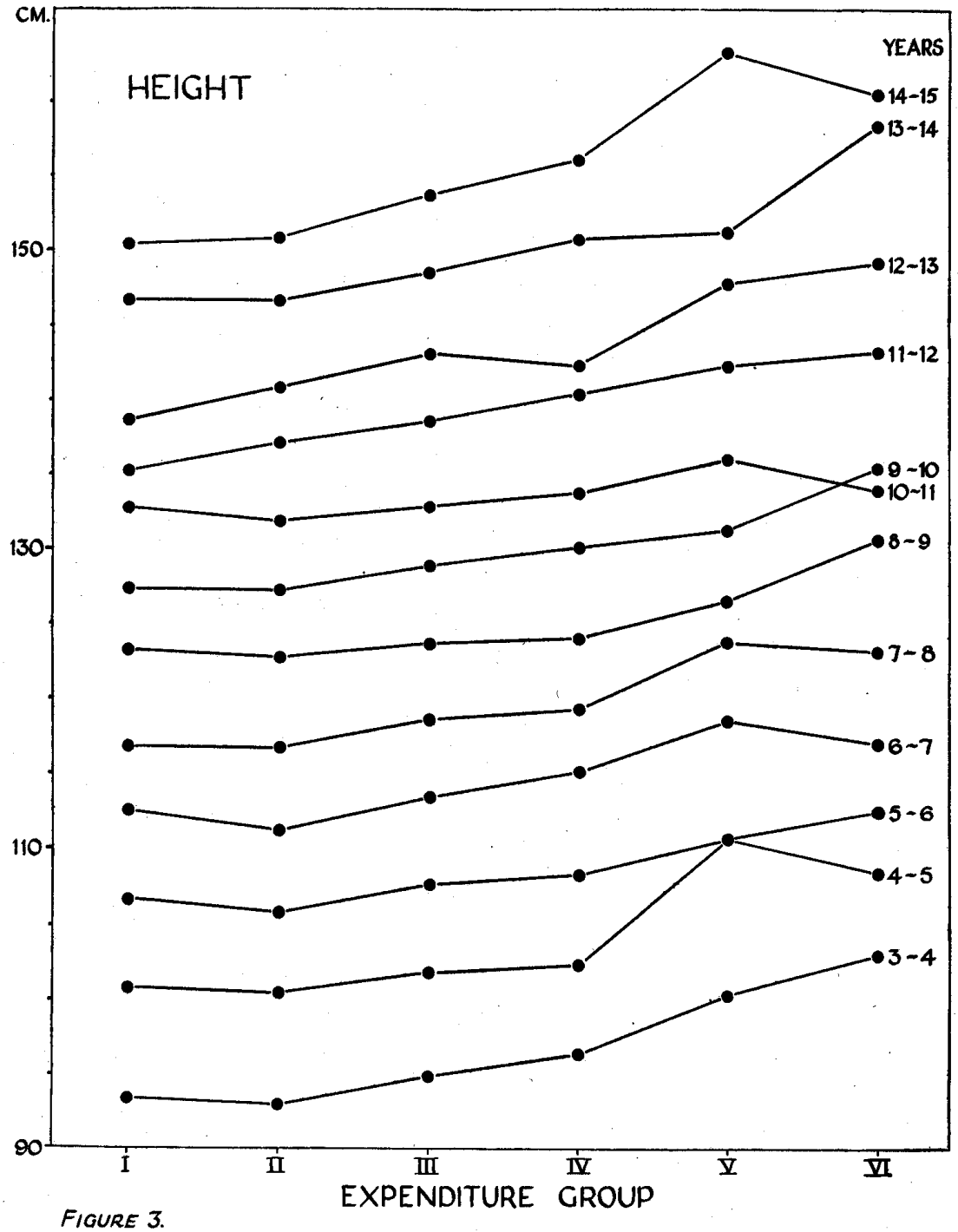
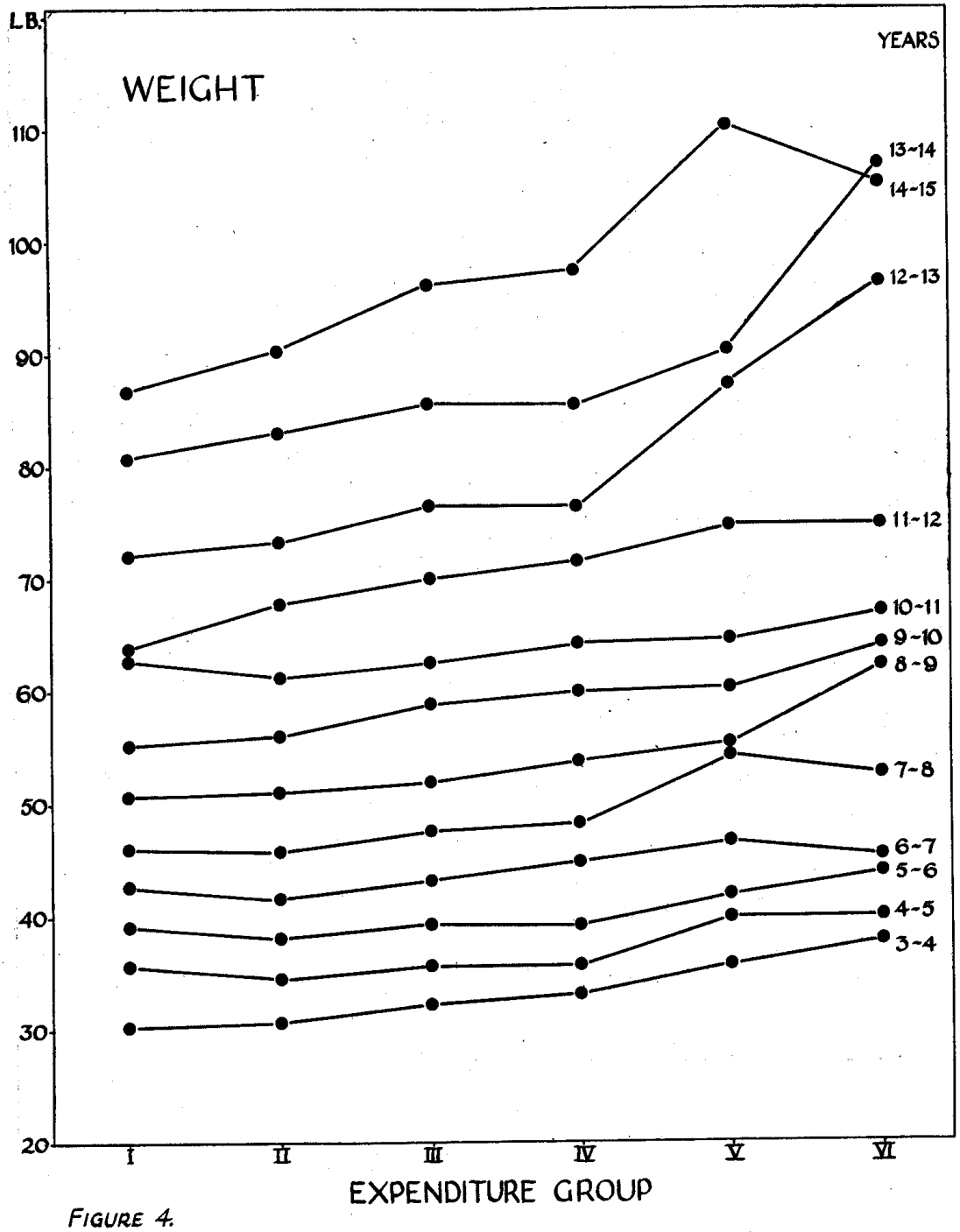


FIGURE 3.


LB.
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40
30
20
13-14
14-15
12-13
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10-11
9-10
8-9
7-8
6-7
5-6
4-5
3-4
I
II
III
IV
V
VI
EXPENDITURE GROUP

FIGURE 4.

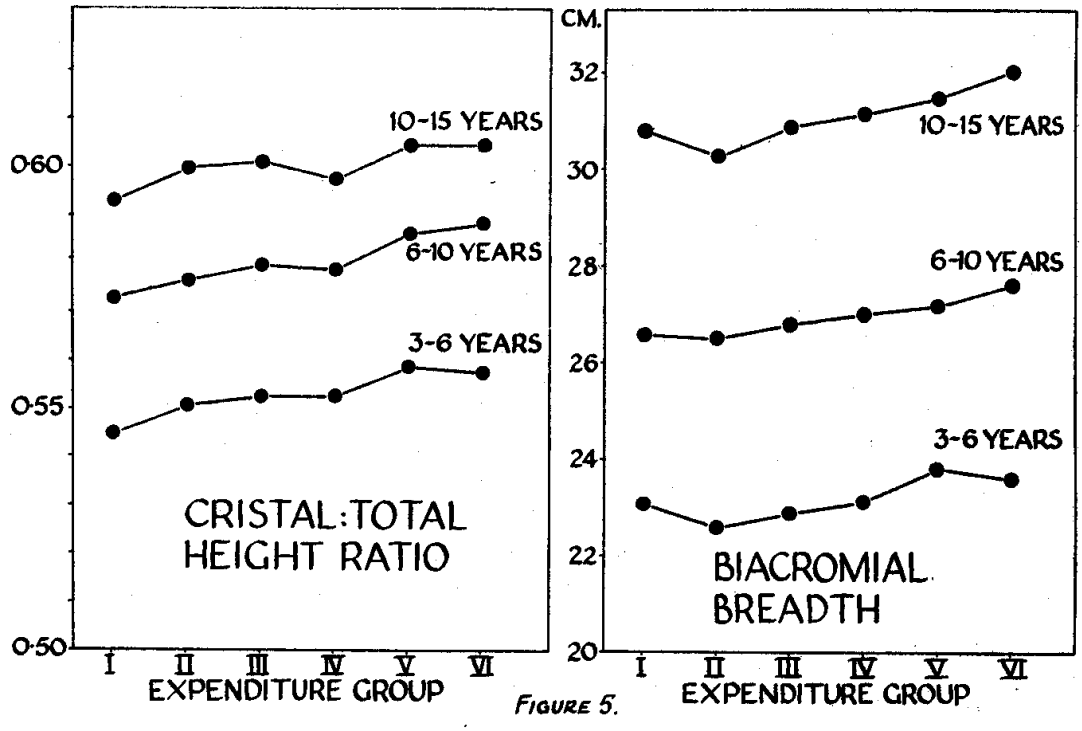


FIGURE 5.

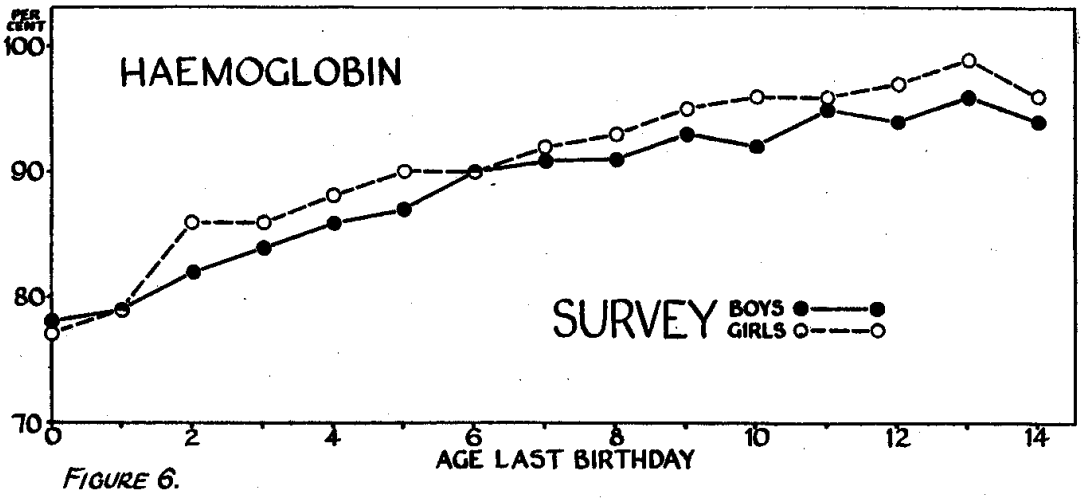
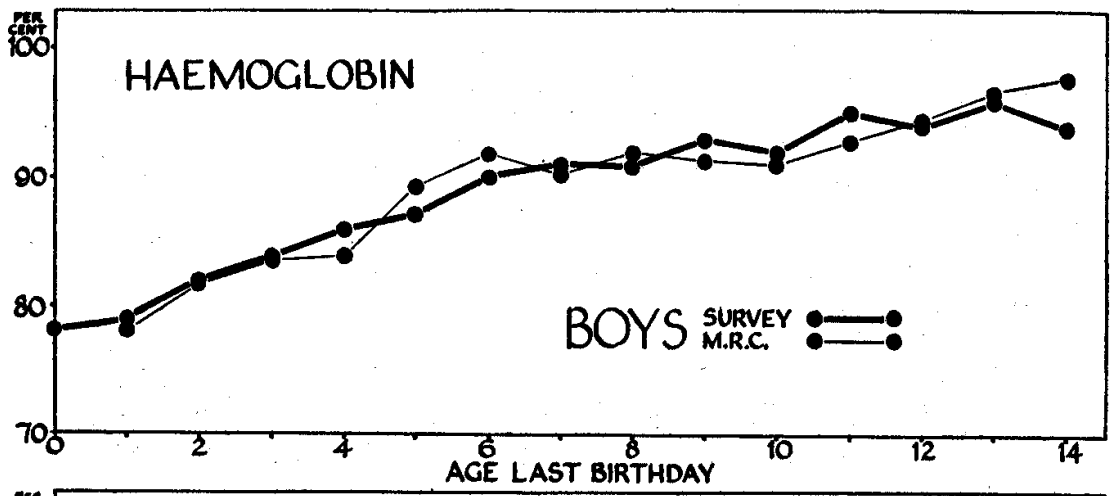


FIGURE 6.


PER CENT
100
90
80
70
HAEMOGLOBIN
BOYS SURVEY
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2
4
6
8
10
12
14
AGE LAST BIRTHDAY

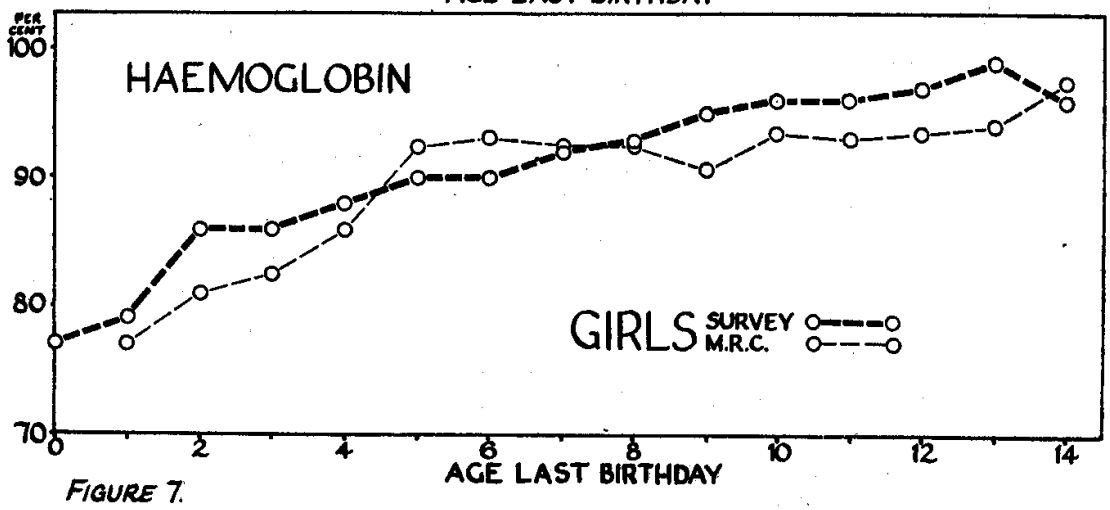
PER CENT
100
90
80
70
HAEMOGLOBIN
GIRLS SURVEY
M.R.C.
0
2
4
6
8
10
12
14
AGE LAST BIRTHDAY

FIGURE 7.

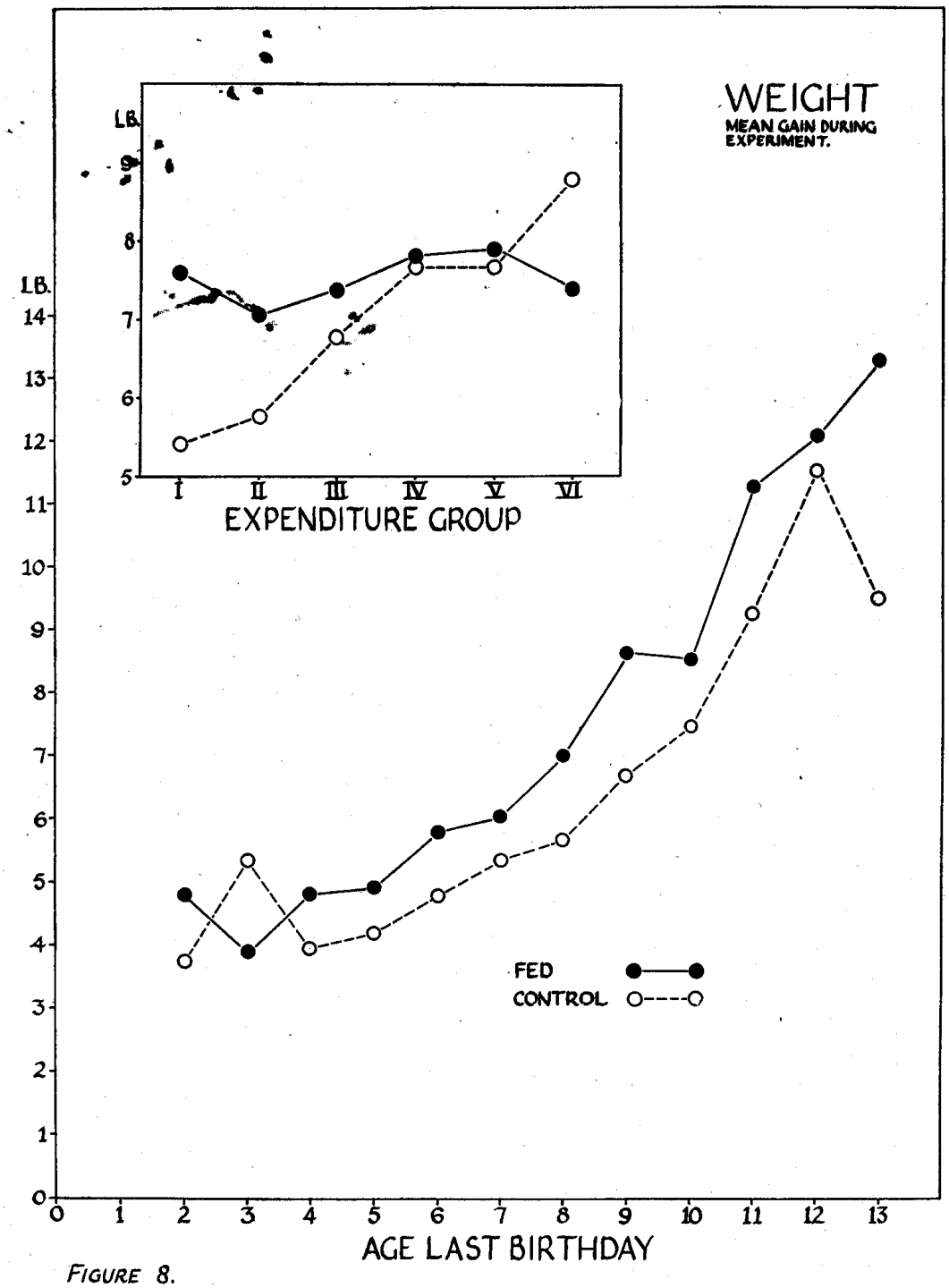
WEIGHT
MEAN GAIN DURING EXPERIMENT.
LB.
9
8
7
6
5
I
II
III
IV
V
VI
EXPENDITURE GROUP
LB.
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13
AGE LAST BIRTHDAY
FED
CONTROL

FIGURE 8.

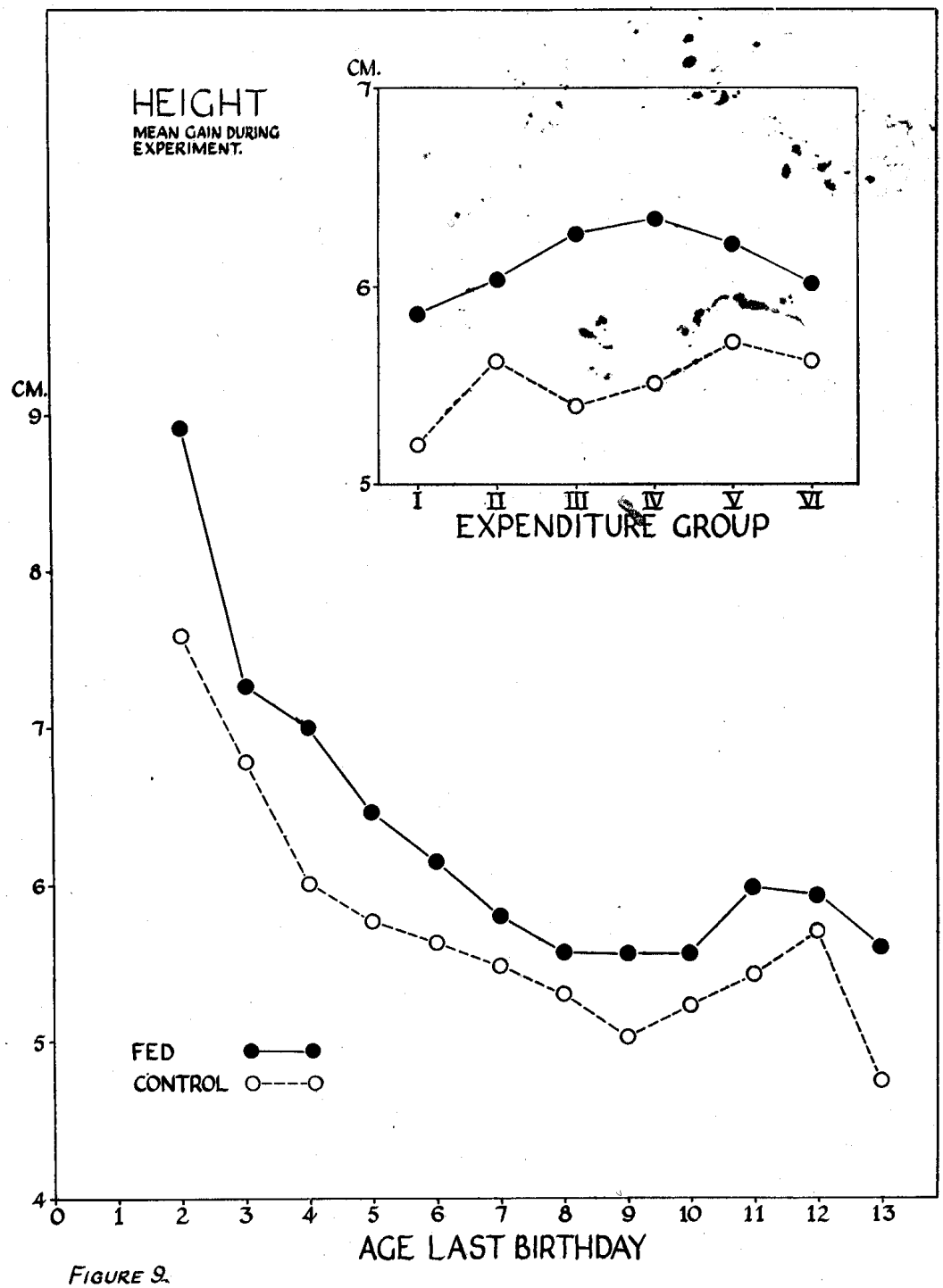
HEIGHT
MEAN GAIN DURING EXPERIMENT.
CM.
7
6
5
I
II
III
IV
V
VI
EXPENDITURE GROUP
CM.
9
8
7
6
5
4
FED
CONTROL
0
1
2
3
4
5
6
7
8
9
10
11
12
13
AGE LAST BIRTHDAY

FIGURE 9.